

# **SYLLABUS FOR MIDDLE SCHOOL**



**STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING  
MIZORAM:AIZAWL**



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**STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING  
MIZORAM: AIZAWL**

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## FOREWORD

The enactment of the Right to Education Act 2009 mandated the State Council of Educational Research and Training (SCERT), Mizoram as Academic Authority for Elementary Education in Mizoram which involves the task of developing the curriculum, textbooks and evaluation procedures. To fulfill one of the duties as the Academic Authority, new textbooks have been developed for Elementary Schools based on National Curriculum Framework (NCF) 2005 and adaptation/translation of NCERT textbooks which have been in use since 2014. A syllabus for Middle Schools based on the NCF 2005 has been developed and compiled to cater to the need of Middle School learners across the State.

It is my privilege to hand over this book to teachers of Mizoram to help them achieve their goals in educating the young minds in shaping the future of the State.

Aizawl  
15<sup>th</sup> October, 2018

  
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## ENGLISH

### *Introduction*

English in India is no longer a language of the colonial masters. In some important domains of activity, it has become an integral part of the Indian multilingual repertoire. In a variety of ways, it has enriched Indian languages, which in turn have made significant contributions to English in India and as it is used abroad. The attitudes of the contemporary Indians towards English are significantly more positive than what we for example find in the Constituent Assembly Debates of 1946-1949.

English plays an important role in the domains of education, administration, business and political relations, judiciary, industry, etc. and is therefore a passport to social mobility, higher education, and better job opportunities. In urban India, it is very common to see young people code-mixing and code-switching between English and Indian languages. It is indeed unfortunate that English has so far remained associated with the rich, elite or upper middle class. It should be the effort of the Indian educational system to reach English to every Indian child and to ensure that she/he gains a sufficiently high level of proficiency in it and not suffer discrimination for lack of it.

The teaching and learning of English today is characterised by the diversity of schools and linguistic environments, and by systemically pervasive classroom procedures of teaching a textbook for success in an examination. The emphasis should be on teaching language use in meaningful and often multilingual contexts. For the majority of our learners, what is needed is a basic or fundamental competence in the target language. We need to develop a focus in which the research on language learning is integrated with language teaching. From the research in language learning, we know that children have an innate faculty to construct grammatical systems on their own. What we need to do in the classrooms, and to the extent possible, outside them is to create socio-cultural contexts that would encourage children to participate actively in understanding and creating appropriate communicative practices. It is extremely important that textbook writers and teachers realize that children learn as much outside as in the classroom, particularly in the case of language since it is there all around them all the time. Playgrounds, street hangouts, recreation centres, picnics, adventure tours etc. are all important sites of language learning from a socio-cultural perspective. If these considerations inform the new textbooks, they are bound to look different. It

would be largely unnecessary and futile to teach isolated grammatical items to students. Grammars would emerge from an active engagement in communicative practices. Input rich methodologies (such as the whole language, the task-based and the comprehensible input approaches) aim at exposure to the language in meaning– focused situations so as to trigger the formation of a language system by the learner.

Input-rich communicational environments are a prerequisite to language learning since languages are learnt implicitly by comprehending and communicating messages, either through listening or reading for meaning. A comprehensible input rich curriculum lays the foundation for spontaneous language growth, and different language skills develop simultaneously in communicative sociocultural contexts rather than in any linear order as reflected in the traditional LSRW approaches. The learner can receive meaningful language input that is appropriate to his/her age and knowledge of language or readiness for language skills, given the variety and range of English-learning situations in India.

There is substantial evidence available now to show that Indian English as used by fluent educated Indian speakers does not differ in any significant way from standard varieties of English in UK or USA. There is no doubt that there are significant differences at the phonological and lexical levels. But that is also true of British and American English within those countries. Indian English can be considered a distinct variety with an identity and status of its own, and should serve as a model in teaching-learning situations.

### ***What is to be taught and how?***

The goals of a language curriculum are twofold: attainment of a basic proficiency, and the development of language as an instrument for basic interpersonal communication and later for abstract thought and knowledge acquisition. One hopes that by the time a student finishes her school, she would become an autonomous learner. This argues for a language-across-the- curriculum approach that breaks down barriers between English and other languages and subject areas. At the initial stages, English may be one of the languages for learning activities designed to enhance children's awareness of their immediate surroundings. It is at this stage that the use of the languages of children may turn out to be most productive for teaching English. It is important to note that children effortlessly learn several languages if adequate comprehensible input is available in anxiety free situations. It is also important to note that simultaneous exposure to

several languages does not as many people tend to believe, ‘confuse’ children. These facts would constitute significant guidelines for teaching strategies in the classroom.

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.

In the case of textbooks, it is imperative that layout and illustrations etc. are treated as integral to the text rather than as mere cosmetic add-ons.

### ***Skills to be fostered***

The development of linguistic proficiency in the learner is needed for the spontaneous and appropriate use of language in different situations.

- The learner should acquire the ability to listen and understand, and should be able to employ non-verbal clues to make connections and draw inferences.
- The learner should develop the habit of reading for information and pleasure; draw inferences and relate texts to previous knowledge; read critically and develop the confidence to ask and answer questions.
- The learner should be able to employ her communicative skills, with a range of styles, and engage in a discussion in an analytical and creative manner.
- The learner should be able to identify a topic, organise and structure thoughts and write with a sense of purpose and an awareness of audience.

- The learner should be able to understand and use a variety of registers associated with domains such as music, sports, films, gardening, construction work, etc.
- The learner should be able to use a dictionary and other materials available in the library and elsewhere, access and collect information through making and taking down notes, etc.
- The learner should be able to use language creatively and imaginatively in text transaction and performance of activities.
- The learner should be able to develop sensitivity towards their culture and heritage, aspects of contemporary life and languages in and around the classroom.
- The learner should be able to refine their literary sensibility and enrich their aesthetic life through different literary genres.
- The learner should be able to appreciate similarities and differences across languages in a multilingual classroom and society.
- It is important for the learner to notice that different languages and language varieties are associated with different domains and communicative encounters.
- The learner should become sensitive to the inherent variability that characterises language and notice that languages keep changing all the time. It is possible for a student to notice the differences between her own speech and the speech of her, say, grandparents.

### ***Attitudes to be nurtured***

Attitudes and motivation of learners and teachers play an important role in all learning, including language learning. When the teacher is positively inclined towards pupils of diverse linguistic, ethnic and socio-cultural backgrounds, pupils will also tend to get positively motivated and involved in the teaching-learning processes. It is extremely important that teachers begin to appreciate the fact that all languages represented in their multilingual classrooms are equally scientific and should receive equal respect from the teacher and the taught. The teacher should also begin to use the multilingual classroom as a resource. Languages flourish in each other's company. They die when

they are isolated as ‘pure objects’. Languages which have become powerful in the modern world have gone through a process of constant borrowing at all levels from other languages and they have still not closed their doors. The day they do so, they will start their journey on the path of destruction. The teacher’s positive attitude will go a long way in lowering the anxiety levels of learners, while raising their awareness levels of self-respect, self-discipline, respect and care for others, interdependence and cooperation.

### ***Content***

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. Neighbourhood 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. Science and Technology
9. Peace and Harmony
10. Travel and Tourism
11. Mass Media
12. Art and Culture
13. Health and Reproductive health

The thematic package given above is suggestive and at each stage should be in line with learners' cognitive level, interest and experience. In every textbook, there should be some lessons, which are translations from other languages.

### ***Time Available***

There are about 220 working days available for teaching/learning amounting to one period per day allotted to the teaching of English. The actual number of periods available, however, may be about 180. The size of the curricular package should be such as can be conveniently covered in the given time.

### **Evaluation**

Evaluation in language should be periodic at regular intervals. Evaluation should be both oral and written. Periodic tests should be conducted and marks obtained in tests should be taken into account in the final grade.

Results of tests and examinations should be treated basically as feedback to teachers. They should guide them in programming their teaching and in organizing remedial work. Evaluation should be linked to assessment of general proficiency rather than to specific achievements.

## **LEVEL – II (CLASS – V)**

### ***Objectives***

The general objectives at Level-II are:

- to provide print-rich environment to relate oracy with literacy.
- to build on learners' readiness for reading and writing.
- to promote learners' conceptualisation of printed texts in terms of headings, paragraphs and horizontal lines.
- to enrich learners' vocabulary mainly through telling, retelling and reading aloud of stories/ folktales in English.
- to use appropriate spoken and written language in meaningful contexts/situations.
- to give them an opportunity to listen to sounds/sound techniques and appreciate the rhythm and music of rhymes/sounds.

- to enable them to relate words (mainly in poems) with appropriate actions and thereby provide understanding of the language.
- to familiarize learners with the basic process of writing.

At the end of this stage learners will be able to do the following:

- narrate his/her experiences and incidents
- exchange his/her ideas with the peers
- carry out a brief conversation involving seeking/giving information
- enjoy reading a story, poem, a short write-up, a notice, poster etc.
- take dictation of simple sentences and to practise copy writing from the blackboard and textbook and to use common punctuation marks
- write a short description of a person, thing or place – prepare a notice, or write a message for someone
- write a short composition based on pictures
- take part in group activity, role play and dramatisation

### ***Language Items***

At the primary level, knowledge of grammar is to be seen mainly as a process of discovering uses and functions of items through exposure to spoken and written inputs. However, for material writers, teachers and evaluators, the following items may provide a framework of reference.

- nouns, pronouns, adjectives, adverbs
- is, am, are, has, have
- tense forms (simple present and present continuous, simple past and past continuous)
- expressing future (will and be going to)
- articles
- this, that, these, those (as determiners and empty subjects)

## *English*

- question words
- punctuation marks (full stop, comma, question mark and inverted commas)
- possessive adjectives
- prepositions

### ***Methods and Techniques***

(At level I, there will be a shift of emphasis from learning of limited input (textbook) to providing exposure to a wide range of inputs.)

- an oral-aural approach to be followed (with limited focus on reading and writing depending on the level)
- learner-centred activity-based approach including bilingual approach
- integration of key environmental, social and arithmetical concepts
- pictures, illustrations, cartoons, and toys to be used to arouse the interest of children
- focus on discussions, project works, activities that promote reading with comprehension depending on the level

## **CLASSES VI – VIII**

### ***Background***

Activities and materials that promote language growth in the early years have been described in some detail in the preceding section. Work at the upper primary level providing a basis for action and interventions in schools is described below. In general, vocabulary development through reading extensively with comprehension and interest and writing activities of a higher order than hitherto developed are the main goals of teaching/learning at this stage.

### ***Objectives***

The general objectives at this stage are:

- to negotiate their own learning goals and evaluate their own progress, edit, revise, review their own work



- to understand, enjoy and appreciate a wide range of texts representing different cultures, ways of living
- to be able to articulate individual/personal responses effectively
- to use language and vocabulary appropriately in different contexts and social encounters
- to be able to organise and structure thoughts in writing/speech
- to develop production skills (fluency and accuracy in speaking and writing)
- to use dictionary suitable to their needs
- to understand and enjoy jokes, skits, children's films, anecdotes and riddles

At the end of this stage learners will be able to do the following:

- understand the central idea and locate details in the text (prescribed and non-prescribed)
- use his/her critical/thinking faculty to read between the lines and go beyond the text
- narrate simple experiences, describe objects and people, report events to peers
- speak accurately with appropriate pauses and clear word/sentence stress to be intelligible in familiar social contexts
- write simple messages, invitations, short paragraphs, letters (formal and informal) applications, simple narrative and descriptive pieces, etc.
- use his/ her proficiency in English to explore and study other areas of knowledge through print and non-print media
- to undertake small projects on a regular basis

### ***Language Items***

At the upper primary level, knowledge of grammar remains a process of discovery combined with a conscious effort to explicitly understand and name

grammatical items. However, these should not be taken out of contexts to be treated as discrete teaching items.

In addition to consolidating the items learnt earlier, the following will be introduced and recycled through the upper primary stage.

- determiners
- linking words
- adverbs (place and types)
- tense forms
- clauses
- passivisation
- adjectives (comparative and superlative forms)
- modal auxiliaries
- word order in sentence types
- reported speech

### ***Methods and Techniques***

Classroom interaction would be such as to promote optimal learner participation leading to an urge to use language both in speech and writing. The selection of actual classroom procedures is left to the discretion of the teacher. However, the following are recommended:

- Role play
- Dramatisation
- Reading aloud
- Recitation of rhymes, poems and making observations on a given topic/theme
- Telling and retelling stories, anecdotes, and jokes
- Discussion, debate
- Simple projects
- Interpreting pictures, sketches, cartoons
- Activities, tasks, and language games
- Pair work, group work, and short assignments both individual and group
- Exploring the electronic media

## MIZO

### ***Thuhma:***

Mizote tan Mizo ṭawng thiam hi a ṭul a, a bik takin Mizorama chengte tan phei chuan tih makmawh a ni. Mahni ṭawng thiam loh hi thil zahthlak tak a nihna lai a awm a, ṭawng dangte chu thiam hle mah ila mahni chipuite be thei lova kan hawihaih mai chuan kan ngaih sanawm loh hle ang. Mahni ṭobul hriat loh lutuk leh hlamchhiah chu thil fel lo tak a ni. Mahni pianpui/hnam ṭawng thiam tak chuan ṭawng dang pawh an thiam hma tih a ni a, zirna atan phei chuan mi thiamten pianpui ṭawnga thil zir hi thiamna tak tak puak chhuah nan a ṭha bik an ti bawk. Chuvangin India ramah pawh Education policy apiangin Primary Education-ah chuan a medium of instruction atan pianpui ṭawng (mother tongue) a rawt zel a ni.

Mizoramah hian Mizo naupangten mahni pianpui ṭawng ngei pawl khat aṭangin kan zir chung a kan thiam teh chiam hlawm lo tlat ṭhin hian chhan a neih ngei a rinawm. Primary Sikulah pawl khat aṭangin ziaik leh chhiar kan zir ṭan a, pawl li thlengin Mizo ṭawng hi subject pakhat a kan zir bawk a. Kan zir nasat ang hûin kan thiam tawk lo fo mai nia lang hi kan zir danah fuh tawk lo a awm ni ngeiin a lang a. A chhan tam tak a awm thei ang a, sikul dinhmun a inang lo va, zirtirtu mal enkawl sikul te pawh kan la nei reng a. Zirtirtu indaih deuhna hmunah pawh Mizo subject hian pawimawhna a chang tawk lo a ni theiin, naupangten an practice tam tawk lo a nih ngei pawh a rinawm.

Ṭawng chu skill a nih miao avangin hman tama thiam a ni tlat si a; chuvangin zirtirtuten thiam ngei tura zirtir a, naupangten thiam ngei tura an zir theih nan tih tur chanpual tam tawk pek leh awmze neia kaihhruai a ṭul hle a ni. Mizo naupangte tan chuan Mizo ṭawng hi thiam sa anga ngaia hlamchhiah deuh emaw, subject dang ang taka ngaih pawimawh ve loh te pawh hmun ṭhenkhatah chuan thil awm thei tak a ni.

### ***Zir tur chhawp chhuah:***

Mizo ṭawng zirna hian tum fel tak a nei a; Mizo ṭawng thiam tak an nih nan te, inbiak pawhna atan te, mi dangte nena chen ho an thiamna atan te, subject dang an zirna hmanrua atan te, mahni hnam ngaihhlutna leh ram hmangaihna an neih nan te, nun dan ṭha an zir chhuaha, an chenna khawvel ṭhang zel man phaa nun hlawhtling an neih nan leh mi dangte zirtir tura thiamna an neihna tur atan te a ni. Tuna Curriculum Framework kan hman mek chhungah hi chuan ṭawng hian hmun laili a chang a, naupangte pianpui ṭawng ṭheuh dah pawimawhna turin a duh a; ṭawng zirna chuan a subject bik zirna class-ah chauh ni lovin, subject dang zir paha ṭawng zir te

lamin a sawi a, chu chu ‘language across the curriculum’ tih leh ‘multi lingual classroom’ tihte a ni. Zalen taka naupangten ṭawng an zir a pawimawh a, boruakin a zir chuan naupangte hian ṭawng chi hrang hrang an zir thiam thei a ni tih leh mi tam tak ngaih dana a ruala ṭawng chi hrang an zir chuan an ngaih pawlh ṭhin tih hi a ni lem lo tih hriat a ṭha. Hei hian classroom-a naupangte kan zirtirnaah pawh min kaihruai se a duhawm hle.

Ṭawng zir thiamna atan hian zirna hmanrua tam tawh chhawpsak an ngai a; textbook te, zirlai puiti lehkhaw dang te, library leh media chi hrang hrangte hman ṭangkai tur a ni a, inbiakna hun tam tawh siam a ngai bawh. An zir tur chu an chenna khawvel mila siam emaw, a ṭul anga her rem zel emaw a ngai bawh. Textbook bikah hian a layout leh illustration-te chu a zirtu naupangte mila siam a pawimawh a; hei hi a chei mawina mai ni lovin a zir tur zinga mi a ni nghal tih hriat a ṭha.

Kan hriat ṭheuh angin ṭawng zirna chuan ngaihlak thiamna te, thusawi thiamna te, lehkhaw chhiar thiamna te leh ziah thiamna te neihtir a, zir zel tur leh hna thawh thei tura ṭawng thiamna (language competency) neihtir a tum a. Tin, ṭawng thiamna chu inbiak tawn theihna (communication skill) bakah thiamna chi hrang hrang kan neih belh zelna atana hmanraw pawimawh ber a ni a. Chuvangin ṭawng zir thiamna chuan chik taka thil chhui te, chanchin khawn khawm te, chumi thliar fel te, chhuidawnna (hypothesis formation) te leh chumi dik leh dik loh fiahna a keng tel tlat a ni tih hriat a pawimawh hle.

India ram ang mi chi hrang hrang leh ṭawng hrang hrang hmangte chen honaah chuan mi dangte ṭawng inzahsaka, ngaihlutpui hi naupangtea tuh a ṭul a; naupangte zir tur chuan intluk tlanna te, kut hnathawh ngaih sanna te, environment humhalh duhna te, remna leh muanna ngainatna te, hnam inpumkhatnate thlan a ṭul a ni. Tunlai khawvel, technology-a ṭhan uak uakna karah pawh hian textbook chu zirna hmanraw pawimawh ber a la ni reng tho lo thei lo a ni. Chuvangin Mizo ṭawng bu pawhin chung zawng zawngte chu a hlanchhiah thei lo va, Mizo thil chauh a zirtir thei lah a ni hek lo. Mizo nihna chhawm nung tur leh tunlai khawvel man phaa thiamna sang zel ban pha tura buatsaih a ṭul khawp mai.

Mizo ṭawng syllabus pawh hian National Policy on Education-in a ngaih pawimawh zual ‘Ten Core Components’ te chu pawl tina zirlai bu buatsaihah hian ngaih pawimawh berah a nei a, chu bakah chuan tunlai khawvelin a mamawh ‘emerging concerns’ heng environment humhalhna lam te, resource renchem te, disaster management te, human rights te leh safety rules lam te a dah pawimawh hle

a. Mizoram bik mamawh nia mi thiamten an sawi leh ngaih pawimawh chu a remchan ang zela telh a ni bawk.

**Ten Common Core Components:** NPE 1986-in a ngaih pawimawh zual core components-te chu hengte hi an ni a:

1. History of India's freedom movement
2. Constitutional obligations
3. Content essential to nurture national identity
4. Indian common cultural heritage
5. Egalitarianism, democracy and socialism
6. Equality of the sexes
7. Protection of environment
8. Removal of social barriers
9. Observance of a small family norm
10. Inculcation of the scientific temper

**Current Concerns:** Heng core components bakah hian tunlai khawvela ramin a mamawh leh ngaih pawimawh current concern-te chu hengte hi an ni bawk:

1. Self, Family, Home, Friends and Pets
2. Neighbourhood and Community at large
3. The Nation – diversity (socio-culture, 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. Science and Technology
9. Peace and Harmony

10. Travel and Tourism
11. Mass Media
12. Art and Culture
13. Health and Reproductive Health

***Zirtirna kalpui dan tur***

Mizo ṭawng kan zirtir chuan a zirtu naupangte chu Mizo ṭawnga thusawi hrang hrang an ngaihthlak te hre thiam a, anmahni pawhin a ṭulna hmuna thu awmze nei leh fiah taka sawi thei tur te, Mizo ṭawnga lehkha zia chhiar dik thei tur leh a thil hmuh leh tawnhriatte chhiar tlaka zia chhuak thiam tura kaihhruai a tum a. Ṭawng zir thiamna atana pawimawh skill palite bakah hian mahni inenkawl theihna (life skill) te, ngaihhlut tur dik te, tunlai huna thiamna te man phaa siama, mi dangte nena chen ho thiamna te anmahniah tuh ngei tur a ni bawk. Chuvangin hengte hi tihpui ṭhin a duhawm hle:

1. Middle School lo lut tir naupangte chuan pawl nga zir tura Mizo ṭawng an thiam tur ang an rawn thiam chhuak em tih lo en fiah phawt a pawimawh hle a ni. Naupangte entry level hriat hian an zir turah nasa takin a pui thei ang.
2. Naupangte chu thu ngaihthlak thiamtir a pawimawh a, Mizo ṭawnga thu sawi ngaihthlak tur chi hrang hrang – mi thusawi (ṭhianté thusawi) TV/Radio-a thusawi leh chhiar ri te chhawpsak a, hre thiamin an ngaihthla em tih ngaihven tur a ni. An thu ngaihthlak te chu sawi chhawntir emaw, zawhna hmanga an dawnawn thiam dan hriat tum bawk ni se.
3. Naupang tinte chu an duh zawng leh mamawh sawi chhuahna hun siamsak ṭhin tur a ni a, a hun leh hmun azira thu sawi dan an thiam theih nan kaihhruai an ngai. Mi malin emaw, a kawpin emaw, a huhovin emaw thusawina hun remchang buatsaih turin sawi hona hun te, inbiakna hun te, titina hun te, mi hmaa thusawina hun te, lemchan hmanga ṭawngna hun leh an thil hmuh leh an thil tawnhriatte sawi chhawwna (report) hun te buatsaih ṭhin tur a ni.
4. Naupangte chu lehkha chhiar thiam tak leh chhiar peih tak an nih a ngai a. Tunlaiah phei chuan lehkha chhiar an ngainat nan ṭan lak a ngai zual hle a ni. Chuvangin Mizo ṭawng chhiar an thiamna, lehkha

chhiar an chin than nan chhiar tur tam tawh hlusak tur a ni. Naupangte chu lehkhah chhiar tur tha bakah an tui zawngh awm ngaihtuahsak a tul a; chuvangin library changtlung tak neih te pawh tum a tha. Lehkhah hi a ri leh ri lova chhiar thiam a tul ve ve avangin a ri lova chhiar hun leh a ria chhiar hun siam a tha. Zirtirtuin emaw, naupang vekin emaw a chhiar dan dika chhiar hmasak (model reading) phawt a tul chang a awm. Chuti lo pawhin an chhiar lo ngaihtlak a, a chhiar dan dik kawhhamuh leh pawh a sawt tho.

5. Naupangten ziaik an thiam ngei ngei a ngai a; mahse thu ziaik thiam tak nih hi thil awlai a nih loh avangin tih than a, mahni an insitna leh lehkhah ziaik an huphurnah bo thak khawpa ziaik tamtir a ngai. Naupangte lehkhah ziaik ang ang chu ngaihlutsak a, ziaik zel tura fuih bakah an thu ziaik apiang te chu tar chhuahsak thin tur a ni. Pawl nga naupangte chuan hawrawppui leh punctuation dik thawkhat takin an hmang thiam tawh tura ngai a ni a, classroom chung leh pawnah thupui thlan sa hmang emaw, an thil hmuh leh hriat chanchin te ziahtir ni se. Heng naupangte kutchhuak hi an Portfolio-ah fel taka vawntir ni se; a remchan dana pho chhuahsaka, an nu leh pate hmuhtir thin ni bawh se.
6. Naupangten Mizo tawng thumal tam tawh an thiam a tul a, an thumal zirte an hman thiam a tul bawh. Mizo tawng zir nuam an tih theih nan thumal leh sentence hmanga infamna (language games) chi hrang hrang te neihpui thin ni se. Hetiang infamna hmang hian spelling te, lam dan dik te a zir theih a, thumal tam tak an hriat belhin a hmanna pawh an zir nghal thei bawh. Mizo tawng hi a muang a, media lama thawk turte tan phei chuan nal tak leh rang taka tawng thiam a pawimawh zual em em a ni. Quiz, extempore leh debate hmang leh intawng ransiak hmang tein bah lo taka tawng a zir theih.
7. Naupangten tawng an thiamna tur chuan remchanna an neih tam a ngai a, hmun hrang hrang tlawhpui te, mi chi hrang hrang kawmna hun te, an thil hmuh leh hriat an sawi chhawna hun leh ziaka report-na hun te siamsak tur a ni. Naupangtinte chuan Diary-te, Scrap Book-te, Note Book leh portfolio-te an neih theuh a tul a, chu chu enfel hun siamsak leh endik thin tur a ni.

8. Ṭawng thiamna atan hian a tira inkaihhruaina a pawimawh êm êm a, chhui zuina a pawimawh hle bawk rualin mahnia inzir chhunzawm hi thiam tak takna ber chu a nih avangin naupangte chu zirna hmanraw ṭul ang angte khawn khawmtir ni se. Milem bu, chanchinbu, zirlai bu leh thu ziaak chi hrang hrangte ken khawmtir a, a vawn ṭhat leh ngaihtuah belh pawh tihtir a, hman dawna lak chhuah te, a dah ṭhat leh te thlengin anmahni kuta dah a ṭha.
9. Ṭawng thiam turin classroom chhung mai a tawk lo va; hmun dang tlawha (field trip) thil thleng chanchin te chhui Chiang tura zawhna zawh te, zawh belhna te, chhanna chhinchhiah te, vawn ṭhat te thiamna an chin ṭhan nan kaihhruai tur a ni. An thil hmuh leh hriat, an chhinchhiahte chu mahni inring tawk taka an sawi chhawn emaw, an ziaak chhuah theih nana kaihhruai bakah Life skill te pawh zir chhuahpui tum ni se.
10. Textbook chhung leh pawna mi hmanga lemchan (role play, skit leh drama etc.) hmangin thil tam tak an thiam chhuah tura beiseite an zir thei ang a, an thiam leh thiam loh pawh a endik nghal theih ang.
11. Naupangte hian a chin chhuaka ṭawng an thiam theih nan hla (poetry) leh thu (prose) leh grammar hmanga an zir a ngai a. Hlain zeizia a nei hrang a, thuin kalhmang a nei bawk a, chung chu grammar hmanga hriat nghehtir a ṭul a. Chuvangin hla te phuahtir a, sentence te siamtir a, thu te phuahtir ṭhin tur a ni. Chung hla leh thu an phuah aṭang chuan grammar pawh zirtir tel zel a ṭha. Chu bakah a hranpa pawhin zirtir bawk tur a ni.

#### TEHNA

Mizoramah chuan Mizo naupangten Mizo ṭawng hi an hman ṭheuhva, an zir vek bawk avangin an thiam thawkhat ṭheuhvin kan hria a ni mai thei a, amaherawhchu mi hneh thei leh ngaihawm taka thu sawi thiam leh mi chhiar châk ngei tura thil ziaak thiam an tlem viau lawi si hi Mizo ṭawng kan zir dan mai ni lo; kan endik (evaluate) ṭhin danin a zir loh vang a nih hmel hle mai.

Sawi tâk ang khan ṭawng thiam leh thiam loh dan en fiah tur chuan naupangte an ṭawng lai tak leh ziah ang angte endik nghal zel a ṭul a. Zirtir lai leh zir hopui pahin ṭawng thiamna skill pali – ngaihthlak, sawi, chhiar leh ziaak an thiam dan chu endik vek ṭhin a ṭul hle bawk. A ngaihthlak chu a hre thiam em tih te, a sawi



chuan awmzia a neiin a sawi dan a dik em tih te, chhiar dan dikan a chhiar em tih te a ziaik dik em tih te en fiah tur chuan khêk theih a ni lo va, zirtir lai mêka tih nghal a tul. Tin, a bu chhung thu hriatna mai ni lovin Mizo tawng an hman thiamna turin an hmasawn dan kawng hrang hrangin en fiah reng thin tur a ni baw.

- 1) **Oral/Class Test:** Zirtir lai leh zirtir zawh velel naupangte chu kâa chhang emaw, ziaik emaw test nghal zel tur a ni. Zirtirna leh evaluation hi kal kawp reng sela, zir paha endik a, endik paha zir nghal zel leh rût nawnpui thin tur a ni. Hetianga tih hian zirlaite an inthlahdah hman lo chang ni lovin an thiam tharte hman chhuahna (practice) remchang an nei a, a sawt bik êm êm a ni.
- 2) **Unit Test:** Class-a zirtir paha test nghal zel bakah zirlai hlawn (unit) khat zir zawh apiangin an enawnna ni pah fawmin test thin baw tur a ni. Naupangte an thiam tawh sa enawnna remchang leh an thiam bel loh laite hmu chhuaka thiam chiantir turin unit test neihpui thin tur a ni.
- 3) **Assignment/Practical/Project Work:** An zirlai nena inkungkaih thil tih tur hrang hrang siamsak thin a, endik tur a ni. An thiam chhuahthe hmanna remchang leh thiam belh tura anmahni ngeiin an zawn chhuaha, an zir thiam tur chi an phâk tâwk mila pek thin baw tur a ni. Hemi atan hian zirlai bu chhûnga mi chauh ni lo, mi dangte râwna an zawn chhuah leh tih theih thil te pawh tihtir thin ni se.
- 4) **Remedial Teaching:** Thiam chhuah ngei tura beiseite an thiam loh chuan zir nawnpui leh tur a ni a. Zirtir dan te thlak danglamin an thiam ngei theihna tura rût nawnpui leh tih tur tam taw siamsak a, naupang dangte leh nu leh pate pawh hmang tangkaia remchanna siam a pawimawh hle. Remedial teaching pek zawhah an hmasawn dan endik leh thin tur a ni.

Tawng zirtirna leh endiknaah hian a sawisel zâwng ringawt ni lova, an tuina tur zâwnga kaihhruai a hlâwk a, an phâk tâwk ang zela dâwm chhoh leh hlawhtlinna hmuhtir (fak thin) a pawimawh êm êm a ni. Tin, naupangte chuan evaluation sheet emaw, test book emaw nei vek sela; anmahni inteh ve thei tura kaihhruai ni se. Naupangte dinhmun chu anmahni leh an nu leh pate hnenah hriattir a, sawipui thin ni baw se. An tihthatah fak a, hmasawn an ngaihna lai kawhmmuh thin a tha. An nu

leh pate pawh an fate dinhmun hrilh hriat a, an chak lohna lai leh puih theih dan tur sawipui a ðha hle bawk.

Middle School, pawl nga aþanga pawl riatah chuan heng tehna hmanrua, Oral test-te, Written written test-te leh Observation hmangeta teh ðhin tur a ni a; a thiam lo deuhthe chu rût nawnpui leh ðhin tur a ni.

Assignment/home-work hi pawl ngaah chuan ni khatah minute 18 vela an tih zawh theih tur ang pek ðhin tur a niha; kar khat chhungin darkar hnih awh vel ni tur a nih laiin Pawl ruk aþanga pawl riatah thung chuan ni khatah darkar khat vel, kar khat chhungin darkar nga/ruk vela an tih zawh theih tur ang chin chauh pek ðhin tur a ni thung.

Middle school zirlai naupangte chuan kum tinin project work an nei ve ðhin ang a, Pawl ngaah Project pathum, pawl ruk chinah chuan project pali tal ti ngei tura beisei an ni.

Heng tehna hrang hrang test te, observation te, assignment-te leh project work-te aþang hian thiam chhuah tura beiseite (expected learning outcomes) an tih theih leh theih loh dan lo chhinchhiah a, fel taka record a, a sawi fiahna nen result siam ðhin tur a ni. Naupang harsatna nei leh hnufum deuhthe chu a bika ennawnpui emaw, group work anga a thiam deuhthe nena inkawptir emawa ðanpui ðhin tur a ni.

## **PAWL V**

***Pawl V zirlaiten an thiam ngei tura beiseite chu hengte hi a ni:***

### **1. Ngaihthlak thiam (Listening):**

- i) A sawitu hmu kher lo pawhin mi thusawi leh thupuan te an hre thiam ang.
- ii) Inbiakna tluangtlan pangngai chin chu a thu kal lam leh haw lam an man thiam ang.
- iii) Mi hla hril leh thu chhamte ngaihnawm ti takin an ngaithla thei ang.

### **2. Tawng thiam (Speaking):**

- i) Thupui thlan sa mâwl tê tê hmangin thu an sawi thiam ang.
- ii) Lemchannaah leh sawi honaah te an tel thei ang.

- iii) A hun leh a hmun azir zelin ngaihdam dilna te, lawm thu sawina leh vui thu emaw lungawi lohna thu emaw te an sawi thiam ang.

**3. Chhiar thiam (Reading):**

- i) Dik tak leh ngaihnawm takin an chhiar thei ang.
- ii) Chanchinbu leh lehkhabyte dik takin an chhiar thiam ang.
- iii) Ri lovin an chhiar thiam ang a, an chhiar awmzia an hre thei ang.
- iv) A thu chhiar aṭangin thil thleng indawt dan an man thiam ang.

**4. Ziah thiam (Writing):**

- i) A thu hriat sa chu hawrawppui hmanna hrang hrang – hawrawppui hlir hmanna turah te, sentence bulah te, hming bik bulah te leh a hmanna tur dangah te hmangin thu an ziaik thiam ang.
- ii) Thufing thenkhat leh Mizo ṭawng upa eng emaw zat an hriain a hman dan pawh an thiam ang.
- iii) Zirlai bua zawhnate chhanna sentence dik takin an ziaik thiam ang.
- iv) Thil lem an hmuh aṭangin thu an phuah thiam ang.
- v) Thawnthu chhumbung an ziaik pum thiam ang.

**5. Grammar:**

Parts of Speech pariatte hming leh Mizo ṭawnga a hrilh fiahna (concept) hre bel tura beisei an ni.

**6. Mizo hnam ro hlu leh ziarâng:**

- i) Mizo hnam nunphung leh ziarâng an hre tam deuh tawhin hlutsak nachang an hria ang.
- ii) Mizoram chanchin leh Mizo thil heng Mizo folktale te, Mizo incheina te, Mizo hnam nunphung thenkhat te an hriat aṭangin ngaih sanna an nei ve tawh ang.
- iii) Hnam rohlu humhalh ngaite leh ngaih san tur dik te an hre ve viau tawh ang.

- iv) Dan zawm pawimawhna an hre thiamin zawm duhna rilru an pu ang.

## 7. Thumal hriat (Vocabulary):

Mizo ṭawng thumal 2000 tal an hria ang a, an hmang thiam ang. Thumal hriat tam ṭulna leh a hmanna chi hrang hrangte hriain ṭawngkauchheh dik an hmang ṭhang ang.

## TEHNA (EVALUATION)

Pawl ngaah chuan Oral, Written, Observation hmanga teh tur a ni a. Assignment/home-work hi ni khatah minute 18 vela an tih zawh theih tur ang pek ṭhin tur a ni. Assignment/home-work hi kar khat chhungin darkar hnih awh vel a ni tur a ni. Heng tehmate aṭang hian thiam chhuah tura beiseite (expected learning outcomes) an tih theih leh theih loh dan lo chhinchhiah tur a niin Project pathum ti tura beisei an ni.

## PAWL VI

*Pawl VI zirlaiten an thiam ngei tura beiseite chu hengte hi a ni:*

### 1. Ngaihthlak thiam (Listening):

- (i) Mi thusawi a ngaihthlâkin a ṭawng leh a hmel lan dan aṭangin a thusawi kalhmang an man thiam ang.
- (ii) Thusawituin a lam rik dik leh dik loh an hre thei ang.

### 2. Ṭawng thiam (Speaking):

- (i) Thawnthu, thil thleng leh an thil tawnte an sawi chhawng thiam ang.
- (ii) Fiah tak leh rang taka thusawi an thiam ang.
- (iii) Thu an sawiin dik takin an sawi thei ang.
- (iv) Hawihhawm taka mi biak an thiam ang.
- (v) Mumal takin zawhna an chhang thiam ang.

**3. Chhiar thiam (Reading):**

- (i) Chhinchhiahna (punctuation mark) zuiin an chhiar thiam ang.
- (ii) Thawnthu tawi te, essay leh lemchan thawnthu te a chhiar dan tur dik takin an chhiar thiam ang.
- (iii) Thu ziak chi hrang hrang zirlai pui theitu apiang an chhiar thiam ang.
- (iv) Nâl tak leh rang taka chhiar an thiam ang.

**4. Ziah thiam (Writing):**

- (i) Kutziak mawi tak leh chhiar nuam takin rang tawk takin an ziak thei ang.
- (ii) A tlangpui zam sa hmangin thawnthu an ziak thiam ang.
- (iii) An thu chhiar tawhte aṭangin zawhna leh chhanna an ziak thiam ang.
- (iv) Ṭawng upa ṭhahnem tawk tak an hriain an hmang thiam ang.
- (v) Mizo ṭawng thumal tihdanglam ṭhin dan (modified form) an hriain an hmang thiam ang.
- (vi) Ṭhian hnena lehkhathawn ziah te, dilna ziah dan te leh sawmna ziah dan an thiamin an ziak thei ang.

**5. Grammar:**

Parts of Speech zinga eng emaw zat chu chipchiar zawkin an zir ang a, an hre chiang sawtin an hmang thiam tawh ang. Noun chi hrang te, Preposition Mizo ṭawnga Postposition te, Conjunction te, Interjection leh Exclamatory mark te an hmang thiam ang

**6. Mizo Nunphung:**

Mizo nunphung leh ziarang an hriat theih nan Mizo thawnthu (folktale) te, Pasalṭha chanchin te, Thiamhnang deh (Art & Craft) te an zir ang a, hmanlai nun leh tunlai nun danglamna hre thiamin ngaih hlut nachang an hria ang.

## 7. Thumal hriat (Vocabulary):

Mizo ṭawng thu mal 2500 tal an hria ang a, an hmang thiam ang. Thumal hriat tam ṭalna leh a hmanna chi hrang hrangte hriain ṭawngkauchheh dik an hmang ṭhang ang.

### TEHNA (EVALUATION)

Pawl rukah chuan Oral test-te, Written test-te leh Observation-te hmangin naupangte thlen chin teh tur a ni a. A thiam lo deuhthe chu rûṭ nawnpui ṭhin tur a ni. Assignment/home-work hi ni khatah darkar khat vela an tih zawh theih tur ang chin chauh pek ṭhin tur a ni a, Project pali tal ti tura beisei an ni. Heng test-te, observation-te, assignment-te project-te an tih dan aṭang hian thiam chhuah tura beiseite (expected learning outcomes) an tih theih leh theih loh dan lo chhinchiah a, fel taka record tur a ni. Naupang harsatna nei leh hnufûm deuhthe chu a bika ennawnpui emaw, group work anga a thiam deuhthe nena inkawptir emaw tea ṭanpui ṭhin ni se.

### PAWL VII

Pawl VII zirlaiten an thiam ngei tura beiseite chu hengte hi a ni:

#### 1. Ngaihthlak thiam (Listening):

- (i) Mi lehkha chhiar leh thusawi an ngaihthlakin ṭawngkam mawi leh dik te an hre thiam ang.
- (ii) Mi thu chham leh hla thu hril an ngaihthlakin a dik leh dik lo an hre hrang thiam ang.

#### 2. Ṭawng thiam (Speaking):

- (i) Inbiakna ṭawngkam hawihhawm te an hmang thiam ang.
- (ii) Nâl tak leh dik takin thu an sawi thiam ve tawh ang.
- (iii) Pawl aiawh emaw mi mal hmingin emaw mamawh leh dilna thu an sawi thiam ang.
- (iv) A hun leh a hmun azira ṭawngkam hman tur an hre hrangin an hmang thiam ang.

- (v) Zawhna an zâwt thiamin mi zawhna mumal takin an chhang thiam ang.

**3. Chhiar thiam (Reading):**

- (i) Hla thu a lam dan tur dik takin hla thu an chhiar thiam ang.
- (ii) Ngaihnawm takin thawnthu an chhiar ri thiam ang.
- (iii) Thuziak a tlangpui hre khawpin an chhiar thiam ang a, chhiar puata a tum lam hawi hre khawpin an chhiar thiam ang.
- (iv) Lehkha chhiar an ching ðhingin tuina an nei ang.
- (v) Ziah zawm tur ðhenkhat in, ti leh tih, inti leh intih bakah suffix atana hman ðhin thute leh ziah zawm loh tur eng emaw chen an hmang thiam ang.
- (v) ðawngkam hman dik loh ðhenkhat an zir ang a, dik takin an hmang thei ang.

**4. Ziah thiam (Writing):**

- (i) Thu an ziahin ziaik zawm put lova paragraph-a ðhen dan an thiam ang.
- (ii) Thupui thlan sa hmangin essay awlsam deuh an ziaik thiam ang.
- (iii) Mi thusawi leh inkawmho thusawi tlangpui ziaikin an lo chhinchhiah thei ang.
- (iv) Mizo thufing leh ðawng upa tam tawk tak an hmang thiam tawh ang.
- (v) Ziah zawm tur leh zawm loh tur eng emaw zat an hriain an hmang thiam tawh ang.
- (vi) Inbiakna (dialogue) a punctuation dikan an ziaik thei ang.
- (vii) Hla thu tluangtlam deuh thu tlangpui (central idea/summary) an ziaik thiam ang.

## 5. Grammar:

Parts of Speech zinga eng emaw zat (e.g: Pronoun leh Adjective then hrang hrangte) chipchiar zawkin an zir belh leh ang a, an hre tam deuh tawh ang.

## 6. Mizo Nunphung:

- i) Mizo nunphung leh ziarang an hriat belh zel nan leh inzirtirna te an hriat nan Mizo thawnthu te, pasaltha chanchin te, Mizo thil leh tawng te an zir ang a, chutiang ngaih hlutna lamah chuan hma an sawn ang.
- ii) Mahni kea ding thei turin Life Skill an zir ang a, an dam khawchhuahna turin thil tha lo laka inven dan an thiam sawt ang.

## 7. Thumal hriat (Vocabulary):

Mizo tawng thumal 3000 tal an hria ang a, an hmang thiam ang. Thumal hriat tam tulna leh a hmanna chi hrang hrangte hriain tawngkauchheh dik an hmang thang ang.

## TEHNA (EVALUATION)

Pawl sarih-ah chuan Oral, Written, Observation hmang tea teh tur a ni a. Assignment/homework hi ni khatah darkar khat vela an tih zawh theih tur ang pek thin tur a ni. Project pali ti tura beisei an ni. Heng tehnaate atang hian thiam chhuah tura beiseite (expected learning outcomes) an tih theih chin leh theih loh dan lo chhinchiah tur a ni. Observation atang te, test-na atang te, assignment leh project an tihna atang te hian naupangte dinhmun chu a sawi fiahna nen result siam ni se.

## PAWL VIII

### *Pawl VIII Mizo tawng zirlaiin a tum:*

1. Tawngkauchheh dik leh tha thiamtir.
2. Zirlaite anmahni irawm chhuak ngeia thu leh hla sawi leh ziah thiamtir.
3. Thusawi an ngaihthlak atanga a pawimawh lai hriat thiamtir.
4. Mi dangte hnenah dik taka an ngaih dan sawi chhuah thiamtir.
5. Thu ziaik eng pawh nal taka chhiar thiamtir.
6. Chhinchhiahna (punctuation) dik tak hmanga thu ziah thiamtir.



***Pawl VIII zirlaiten an thiam ngei tura beiseite:***

**1. Ngaihthlak thiam (Listening):**

- (i) Mi thusawi rêng rêng dawhthei takin an ngaihthla theiin an thusawi tlangpui an hre thiam ang.
- (ii) Thusawi an ngaihthlakin țawngkam mawi leh mawi lo te, țawngkam hawihhawm leh hawihhawm lo te an thliar hrang thiam ang.
- (iii) Thusawi leh mi thu chhiar rik an ngaihthlakin a pawimawh lai deuhte lo chhinchhiah an thiam tawh ang.
- (iv) Hla thu chhiar an ngaihthlakin a awmzia an hre thiamin eng lam hawi hla nge tih an thliar thiam ang.

**2. Țawng thiam (Speaking):**

- (i) Mizo țawng hman dan dik leh dik lo an hre viau tawh ang.
- (ii) Nâl tak leh dik takin thu an sawi thiam ang.
- (iii) Thinrim râwl leh duhsakna âwkâ an hmang thiam ang.
- (iv) Mi mal tana dilsakna te leh pawl aiawha dilna te an sawi thiam ang.
- (v) Mi dang hnenah an ngaih dan an sawi chhâwng thiam ang.
- (vi) Mi dangte nena thil sawi honaa an telin an sawi thei ve tawh ang.

**3. Chhiar thiam (Reading):**

- (i) Thuziak chi hrang hrang – thawnthu te, essay-te leh mi mal chanchin te a awmze hre thiam chungin a ri leh ri lovin an chhiar thiam ang.
- (ii) Hla thu chi hrang hrang a chhiar dan tur dikin an chhiar thiam ang.
- (iii) Mizo țawnga thu ziak eng pawh nâl takin an chhiar ang
- (iv) Thuziak mawi ngaihhlut nachang an hre Țan ang.

**4. Ziah thiam (Writing):**

- (i) Mizo țawng hman dan dik leh dik lo leh a ziah zawm tur leh zawm loh tur te an hre tam deuh tawhin an hmang thiam ve tawh ang.

- (ii) Thupui thlan sa hmangin essay thumal 150 – 200 an ziaak thiam ang.
- (iii) Hla thu thenkhat te tawng tuang pangngaiin an dah thiam ang.
- (iv) Zirlai kaihnawih zawhna an ngaih danin an chhang thiam ang.
- (v) Mizo thufing leh tawng upa hman tlânglâwn deuhthe hmangin thu an phuah thiam ve tawh ang.
- (vi) Thil lo thleng an hmuh dan leh an ngaih dan an ziaak chhuak thiam ang.
- (vii) Ngaihnawm tak leh awmze nei takin lekhathawn an ziaak thiam tawh ang.

**5. Grammar:**

Parts of Speech zinga an la zir lohte chipchiar zawkin an zir ang a, a hman dan pawh an thiam ve hle tawh ang (e.g: Verb leh Averb)

**6. Mizo Nunphung:**

- (i) Mizo nunphung (culture) an hriat belh zel nan leh Mizote tobul leh khawtlang nun an hriat thiam nan Mizo chanchin (history) te, Mizo thawnthu te, Mizo pasaltha/mi entawn tlak chanchin te leh Mizo thil te an zir ang a, humhalh tur leh vawn that tur te an hriat phah ang a, chu chuan nun kawng dikah a hruai ang.
- (ii) Mizo naupangten Mizo nihin a ken tel tlat Mizote hlutsak zawng leh inzirtirna (value/moral education) te chu thu leh hla bakah drama hmang tein an zir ang a, tunlai khawvel mamawh hri tha lo laka inven dan leh sual chi hrang hrang laka inthiar fihlim thei tura life skill pawimawh an zir chhuak bawh tura beisei a ni.

**7. Thumal hriat (Vocabulary):**

Mizo tawng tuang pangngai thumal chu an hre kim ve thawkhat tawh ang a, a tul hunah an hmang thiam ang. An thumal hriatte a hmanna chi hrang hrangin an hmang dik theiin tawngkauchheh dik an hmang thatang ang.

### **TEHNA (EVALUATION)**

Pawl riatah chuan Oral test-te, Written test-te leh Observation-te hmanga naupangte thiamna endik tur a ni a.

Assignment/homework hi ni khatah darkar khat vela an tih zawh theih tur ang pek thin tur a ni. Heng tehna te aṭang hian thiam chhuah tura beiseite (expected learning outcomes) an tih theih leh theih loh dan lo chhinchhiah tur a ni. Pawl riat naupangte chuan a tlem berah pawh project pali tal ti tura beisei a ni.

## HINDI

### GENERAL AIMS (CLASS V – VIII)

1. Hindi hi India hnam ṭawng a nih mai bakah State dangte nena inzawmna neih ṭhat leh zualna atana hmanraw ṭangkai ber pakhat a nih avangin naupangte thinlunga thiam chākna tuh leh thiam ngei tura zirtir.
2. Hindi alphabet (Devnagiri script) lam dan leh ziaik dan dik zirtir.
3. Hindi ṭangkaina leh a pawimawhna zirlaite hriattir a; an zirna kawnga theih tawpa kaihhruai.
4. Thumal leh sentence tawi tē tē chhiar thiam a, ziaik thiam tur leh hmang thiam tura zirtir.
5. Hindi thumal an hriat sa leh an chhehvella thil hmuh theihthe hmanga naupangte sentence siam zirtir.
6. Zawhna siam dan leh a chhan dan awlsam tē tē zirtir.
7. Hindi ṭawng a hriat leh hmuh phāk ang te Mizo ṭawng/mahni pianpui ṭawnga letling thei tura zirtir.
8. An nitin nunah Hindi thumal an zir tawhte hmang ṭangkai tura zirtir.
9. Poem, huaisenna, leadership, ram hmangaihna, awmdan mawi, ṭawngkam mawi, hriselna, hnam inpumkhatna, inlaichinna leh an bul vela thil awmte chanchin hrethiam a, Hindi-a ziaik chhuak thei tura zirtir.
10. Grammar item, e.g: Noun, Pronoun, Adjective, Verb, Gender, Number, etc. te thiamtir.

### CLASS V

#### SPECIFIC AIMS

##### **1. Language Skills:**

- a) Devnagiri alphabet ennawnpui a, a rīk dan dik taka lam, chhiar leh ziah zirtir.
- b) Thumal hrang hrang leh sentence awl tē tē te a ri dik taka lam, chhiar leh ziah thiamtir.
- c) Hindi an lamrik te ziaik thiam tura zirtir.
- d) Basic grammar, e.g: Number, Gender, etc. hmelhriattir.
- e) Consonant hawrawp chanve insiam dan, chumi aṭanga thumal siam nana hman a nih dan te leh hmanna te hriat beltir.

## 2. *Knowledge of the Language:*

- a) Vowel leh consonant-te a lam rîk dan leh ziah dan thiamtir.
- b) Anuswar, Chandrabindu leh Visarg-te a lam dan dik leh hmanna te thiamtir. E.g: ज्ञं वृद्धिं इति etc.
- c) Consonant hawrawp chanve hmanna chhiar leh ziah thiam zirtir. E.g: इदं जलं च [r] ड; कदं etc.
- d) Pangpar hming, ramsa leh sava te hram dan ri hrang hrang hriattir leh ziah thiamtir.
- e) Hindi grammar – Number, Gender, Tense, Verb leh Pronoun te a thumal leh sentence-a hmang thiam tura zirtir.
- f) An zir tawh thumal leh sentence te an nitin nuna hman tângkai dan tur zirtir.
- g) Poem chhiar dan leh ziah dan zirtir.
- h) Number 1 – 50 ziah leh chhiar zirtir.

## 3. *Environmental Knowledge:*

- School, classroom, inchhung, ran vulhte, ramsa leh sava te nena inkungkaih thumal thenkhatte hriattir a, a tul huna hman thiam zirtir.

## 4. *Textbook:*

- Pictorial leh structural method (a lem nena zirtir) a zirtir a nih dawn avangin vowel leh consonant thumal leh a lem colour-a entir.

## 5. *Work & Exercise:*

- a) Lesson-a mi hawrawp, thumal leh sentence te chhiar leh ziah thiam tura exercise tam tawh neihpui.
- b) Hindi vowel leh consonant nalh taka ziah thiam tura practise-pui.
- c) Thumala ज्ञं (ra) hman dan hrang hrang, e.g: ई देव वृ etc. te a lam dan dik leh ziah dan dik practise-pui.
- d) Spelling test a tam thei ang bera neihpui thin.
- e) Verb (order form) thumal an hriat thante leh sentence awl têt têt hmangin practise-pui tur.
- f) Number 1 – 50 sawi dan leh ziah dan bel taka thiamtir.
- g) Lesson tinah oral skills practise-na tur exercise dah vek a ni a, hengte hi a tam thei ang ber practise-pui tur a ni.

## CLASS VI

### SPECIFIC AIMS

#### 1. *Language Skills:*

- a) Vowel leh consonant hmanga Hindi thumal thar siam dan oral leh written-a zirtir.
- b) Vowel leh vowel sign hman dan zirlaiten an thiam chian theih nan thumal pahnih/pathum theuh hmanga oral leh written-a zirlaite practice-pui.  
E.g: vej] vew] v~~ck~~k] br] etc.
- c) Consonant hawrawp hlang chauh hmanga thumal siam zirlaiten an thiam theih nan siamtir ve a, a lam dan, chhiar leh ziaik dan practise-pui.  
E.g: dye] ued] t y] l ery] etc.
- d) Hindi thu awmze nei, sentence tawi tê tê siamtir.

#### 2. *Knowledge of the Language:*

- a) Thumal 150 – 200 vel thiam belhtir.
- b) Number 1 – 70 sawi dan leh ziah dan thiamtir.
- c) Mizoram leh India ram chanchin tlangpui – hmun pawimawh, ramri, tlang leh lui hmingthang leh ram hruaitu larte chanchin zirlaite hriattir.
- d) Damlohna (natna) leh doctor hnena inentirna kaihhnawih damdawi hming leh natna hming pali/panga tal thiamtir.

#### 3. *Environmental Knowledge:*

- a) Kum khata thla awm zât, thla khata ni awm zat, kar khata ni awm zat leh an hming zirlaite hriattir.
- b) Bazarna, zin veivahna, etc. atana hman chi thumal tangkai mawl tê tê si conversation lesson hmanga hriattir.
- c) Mizoram sik leh sa chungchang lesson siam ni se.
- d) Chhungkua leh inlaichinna sawina thumal pariat/sawm awmna lesson siam ni se.

#### 4. *Textbook:*

- a) An zirlaibu atang hian thumal 120 – 180 thiam belh tura beisei a ni. Heng thumalte hi nitin khawsakna atana pawimawh naupangten an thiam mai theih tura thu awlsam ni thei se.
- b) Hla/Poem tawi, zirtir nei tha leh belhchian dawl pathum/pali vel dah ni se.

- c) Thawnthu tawi, zirtir nei tha leh belhchian dawl pathum/pali vel dah ni se.
- d) Inbiakna/Conversation hi lesson pathum/pali tal dah ni se. Nitin nuna an hman tangkai theih tur thumalte hman ni se.
- e) Lesson tin tawpah Maukhik Path, zirlaite sawi ve tur dah ni se. Maukhik Path-ah hian lesson mil tur thu hman ni se.
- f) Grammar an hmelhriat theih nan grammar lesson tawi leh awlsam lesson pakhat/pahnih dah ni se.

### 5. *Work & Exercise:*

- a) Combined consonant exercise a tam thei ang bera practise pui ni se.  
E.g: jkVh | iQrd| xQr| etc.
- b) Sentence construction mawl tê tê siamna atana tangkai thei tur zawng Singular leh Plural Number, Gender lam exercise tam thei ang neihpui ni se.
- c) Lesson atanga thumal an zir te anmahnia sentence dik taka an siam thiam ve na tura exercise tihpui.
- d) Simple Masculine & Feminine Gender, Noun leh Singular & Plural thumal te sentence-a hman dan exercise zangkhai taka neihpui ni se.

## CLASS VII

### SPECIFIC AIMS

#### 1. *Language Skills:*

- a) Zirlai naupangte an zirlaibu ngaina tur leh zir châk tura kaihhruai.
- b) Zirlaibu chhunga mi thumal leh sentence-te an nitin nuna hmang tangkai tura zirtir.
- c) Zirlaiten an thil hmuh leh hriat te a awmzia hrethiam a, sawi chhuak leh ziaak chhuak thiam tura zirtir.
- d) Vowel sign leh consonant hawrawp chanve hmanna te leh a hman dan thiamtir.

#### 2. *Knowledge of the Language:*

- a) Vowel leh consonant hawrawp hrang, a lam rik dan inzûl hote a rik dan dik zirtir. E.g: v&v| b&b| m&A| c&o| H&e| <&<+etc.
- b) Number 1 – 100 sawi dan leh a thua ziaak thiamtir.
- c) Hindi-a thuziak an hmuhte a lam dan dik taka chhiar leh ziaak thiamtir.

- d) Zirlaibua poem awmte chhiar dan tur dik taka chhiar zirtir a, a awmzia hriattir.
- e) Zirlaibua thawnthu awmte midang hnena sawi chhawng thei tura zirtir.
- f) An zirlaibua word meaning-te thiam beltir.
- g) Poem, thumal leh sentence-te hmangin Tense, Gender, Number leh Verb te hman dan zirtir.

**3. *Environmental Knowledge:***

- a) Infiamna (football, hockey, etc.), thawnthu (hmangaihna, inthianna, etc.), ramhnuai leh kût hrang hrang chanchin dik tak leh mawi taka chhiar thiamtira hriattir.
- b) Hnam inpumkhatna hla thiamtir.
- c) Mi ropui te chanchin chhiar leh ziaak thiamtir a, a awmzia hriattir.

**4. *Textbook:***

- a) Hnam inpumkhatna hla (poem) dah tel ni se.
- b) Mizo culture nena inrem thawnthu telh ni se.
- c) Number 1 – 100 lesson-ah dah ni se.
- d) Lesson tinah oral lesson telh ni se. Lesson-ah hian Case ending, Pronoun, Tense, Adjective, Gender leh Number hmanna te a tam thei ang telh ni se.
- e) Thumal thar 250 – 300 vel dah ni se.

**5. *Work & Exercise:***

- a) Zirlaibu chhunga thumal, sentence leh poem-te a lam rik dan dik taka lam rik zirtir a, mawi taka ziaak tura practise-pui.
- b) Noun, Pronoun, Verb, Adjective, Number leh Gender-te hriat hrantir a, a hmanna te lesson-a mi ang zulzuia a tam thei ang ber practise-pui.
- c) Lesson tina word meaning-te thiam beltir.
- d) Lesson tina zawhna awmte chhang thei tura exercise tihpui.
- e) Lesson tina oral lesson-te aṭanga an zir chhuah zulzuiin zirlaite anmahnia an duhzawng sawi ve thiam tura zirpui.



## CLASS VIII

### SPECIFIC AIMS

#### 1. *Language Skills:*

- a) Hindi hawrawp ziaik leh chhiar bel/nal taka thiamtir.
- b) Zirlaiten an thil hmuh leh hriat te hriat thiamna nei tura zirtir.
- c) Thumal leh sentence an lo zir tawh sa te hmang tangkai tura naupang zirtir.
- d) Hindi tawnga midangte nen inbe thei tura zirtir.
- e) An duhzawng leh ngaih dante Hindi-a sawi leh ziaik thiam tura zirtir.

#### 2. *Knowledge of the Language:*

- a) Poem chhiar dan leh a awmzia hrethiam tura zirtir.
- b) Eizawwna chi hrang hrang leh an chanchin hriattir a, ziaik leh chhiar thiamtir.
- c) Grammar an zir tawh sa thiam beltir. An thiam sa bakah Verb, Adjective leh Number 1 – 100 sawi dan leh a thua ziah dan zirtir.
- d) Mizo thawnthu, Olympics, Christmas, UNO, ruihhlo, mi ropui te chanchin (e.g: Rokunga, etc.) chhiar leh ziaik zirtir a, a awmzia hriattir.
- e) An mamawh leh duh zawngte sawi leh ziaik thei tura zirtir.
- f) Chawlh dilna leh thil dang dilna (application letter) ziah dan zirtir.

#### 3. *Environmental Knowledge:*

- a) Infiamna chungchang, ruihtheih thil lam, UNO, computer, atmosphere, khawpui/hmun pawimawh fan thu, phone-a inbiakna, mi ropuite chanchin, eizawwna hrang hrang, kût, etc. chanchin zirtir.
- b) An kal velnaa an thil hmuh leh hriat chanchin sawi thiam tura zirlaite tanpui.
- c) Historical monument (India ram leh ram dang) zirtir ni se.
- d) Geographical hmun pawimawh (Mizoram chhung leh khawvel hmun dang) chanchin zirtir ni se.

#### 4. *Textbook:*

- a) Thumal thar 250 – 300 vel dah ni se.
- b) Lesson tinah naupangten anmahnia an tih ve tur exercise dah tel zêl ni se.
- c) Hla (poem) pathum/pali dah ni se.
- d) Thawnthu zirtir nei tha pahnih/pathum telh ni se.

- e) Conversation lesson pathum/pali dah tel ni se.
- f) Geographical leh historical hmun pawimawh lesson-ah telh ni se.

**5. *Work & Exercise:***

- a) Zirlaite an zirlaibua mi bel taka thiam tura oral leh written hmanga a tam thei ang practise-pui.
- b) An zir tawh thumal, sentence leh number 1 – 100 hmang ʔangkai tura zirpui.
- c) Lesson tin tawpa oral lesson dahte practise puiin, heng lesson aʔang hian a tlukpui sentence dang siam thiam tura zirtir.

## MATHEMATICS

The development of the upper primary syllabus has attempted to emphasise the development of mathematical understanding and thinking in the child. It emphasises the need to look at the upper primary stage as the stage of transition towards greater abstraction, where the child will move from using concrete materials and experiences to deal with abstract notions. It has been recognised as the stage wherein the child will learn to use and understand mathematical language including symbols. The syllabus aims to help the learner realise that mathematics as a discipline relates to our experiences and is used in daily life, and also has an abstract basis. All concrete devices that are used in the classroom are scaffolds and props which are an intermediate stage of learning. There is an emphasis in taking the child through the process of learning to generalize, and also checking the generalization. Helping the child to develop a better understanding of logic and appreciating the notion of proof is also stressed.

The syllabus emphasises the need to go from concrete to abstract, consolidating and expanding the experiences of the child, helping her generalise and learn to identify patterns. It would also make an effort to give the child many problems to solve, puzzles and small challenges that would help her engage with underlying concepts and ideas. The emphasis in the syllabus is not on teaching how to use known appropriate algorithms, but on helping the child develop an understanding of mathematics and appreciate the need for and develop different strategies for solving and posing problems. This is in addition to giving the child ample exposure to the standard procedures which are efficient. Children would also be expected to formulate problems and solve them with their own group and would try to make an effort to make mathematics a part of the outside classroom activity of the children. The effort is to take mathematics home as a hobby as well.

The syllabus believes that language is a very important part of developing mathematical understanding. It is expected that there would be an opportunity for the child to understand the language of mathematics and the structure of logic underlying a problem or a description. It is not sufficient for the ideas to be explained to the child, but the effort should be to help her evolve her own understanding through engagement with the concepts. Children are expected to evolve their own definitions and measure them against newer data and information. This does not mean that no definitions or clear ideas will be presented to them, but it is to suggest that sufficient scope for their

own thinking would be provided.

Thus, the course would de-emphasise algorithms and remembering of facts, and would emphasise the ability to follow logical steps, develop and understand arguments as well. Also, an overload of concepts and ideas is being avoided. We want to emphasise at this stage fractions, negative numbers, spatial understanding, data handling and variables as important corner stones that would formulate the ability of the child to understand abstract mathematics. There is also an emphasis on developing an understanding of spatial concepts. This portion would include symmetry as well as representations of 3-D in 2-D. The syllabus brings in data handling also, as an important component of mathematical learning. It also includes representations of data and its simple analysis along with the idea of chance and probability.

The underlying philosophy of the course is to develop the child as being confident and competent in doing mathematics, having the foundations to learn more and developing an interest in doing mathematics. The focus is not on giving complicated arithmetic and numerical calculations, but to develop a sense of estimation and an understanding of mathematical ideas.

### **General Points in Designing Textbook for Upper Primary Stage Mathematics**

1. The emphasis in the designing of the material should be on using a language that the child can and would be expected to understand herself and would be required to work upon in a group. The teacher to only provide support and facilitation.
2. The entire material would have to be immersed in and emerge from contexts of children. There would be expectation that the children would verbalise their understanding, their generalizations, their formulations of concepts and propose and improve their definitions.
3. There needs to be space for children to reason and provide logical arguments for different ideas. They are also expected to follow logical arguments and identify incorrect and unacceptable generalisations and logical formulations.
4. Children would be expected to observe patterns and make generalisations. Identify exceptions to generalisations and extend the patterns to new situations and check their validity.

5. Need to be aware of the fact that there are not only many ways to solve a problem and there may be many alternative algorithms but there may be many alternative strategies that maybe used. Some problems need to be included that have the scope for many different correct solutions.
6. There should be a consciousness about the difference between verification and proof. Should be exposed to some simple proofs so that they can become aware of what proof means.
7. The book should not appear to be dry and should in various ways be attractive to children. The points that may influence this include; the language, the nature of descriptions and examples, inclusion or lack of illustrations, inclusion of comic strips or cartoons to illustrate a point, inclusion of stories and other interesting texts for children.
8. Mathematics should emerge as a subject of exploration and creation rather than finding known old answers to old, complicated and often convoluted problems requiring blind application of un-understood algorithms.
9. The purpose is not that the children would learn known definitions and therefore never should we begin by definitions and explanations. Concepts and ideas generally should be arrived at from observing patterns, exploring them and then trying to define them in their own words. Definitions should evolve at the end of the discussion, as students develop the clear understanding of the concept.
10. Children should be expected to formulate and create problems for their friends and colleagues as well as for themselves.
11. The textbook also must expect that the teachers would formulate many contextual and contextually needed problems matching the experience and needs of the children of her class.
12. There should be continuity of the presentation within a chapter and across the chapters. Opportunities should be taken to give students the feel for need of a topic, which may follow later.

## **CLASS V**

### **Geometry**

**(16 hrs.)**

#### **SHAPES & SPATIAL UNDERSTANDING**

- Gets the feel of perspective while drawing a 3-D object in 2-D.
- Gets the feel of an angle through observation and paper folding.
- Identifies right angles in the environment.
- Classifies angles into right, acute and obtuse angles.
- Represents right angle, acute angle and obtuse angle by drawing and tracing.
- Explores intuitively rotations and reflections of familiar 2-D shapes.
- Explores intuitively symmetry in familiar 3-D shapes.
- Makes the shapes of cubes, cylinders and cones using nets especially designed for this purpose.

### **Numbers**

**(40 hrs.)**

#### **NUMBERS AND OPERATIONS**

- Finds place value in numbers beyond 1000.
- Appreciates the role of place value in addition, subtraction and multiplication algorithms.
- Uses informal and standard division algorithms.
- Explains the meaning of factors and multiples.

#### **MENTAL ARITHMETIC**

- Estimates sums, differences, products and quotients and verifies using approximation.

#### **FRACTIONAL NUMBERS**

- Finds the fractional part of a collection.
- Compares fractions.
- Identifies equivalent fractions.
- Estimates the degree of closeness of a fraction to known fractions ( $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{3}{4}$ , etc.)
- Uses decimal fractions in the context of units of length and money.
- Expresses a given fraction in decimal notation and vice versa.

**Money (5 hrs.)**

- Applies the four operations in solving problems involving money.

**Measurement (26 hrs.)**

**LENGTH**

- Determines area and perimeter of simple geometrical figures.
- Applies the four operations in solving problems involving length, weight and volume.
- Relates commonly used larger and smaller units of length, weight and volume and converts one to the other.
- Applies simple fractions to quantities.
- Converts fractional larger unit into complete smaller units.
- Appreciates volume of a solid body: intuitively and also by informal measurement.
- Uses addition and subtraction in finding time.

**Data Handling (6 hrs.)**

- Collects two-dimensional quantitative data. represents the data in the form of a table.
- Draws a bar graph or a pictograph to present a data.

**Patterns (6 hrs.)**

- Identifies patterns in square numbers, triangular numbers.
- Relates sequences of odd numbers between consecutive square numbers.
- Makes border strip and tiling patterns.

**CLASS VI**

**NUMBER SYSTEM (60 hrs)**

**(i) *Knowing our Numbers:***

Consolidating the *sense* of numberness up to 5 digits, Size, estimation of numbers, identifying smaller, larger, etc. Place value (recapitulation and extension), connectives: use of symbols =, <, > and use of brackets, word problems on number operations involving large numbers up to a maximum of 5 digits in the answer after all operations. This would include conversions of

units of length & mass (from the larger to the smaller units), estimation of outcome of number operations. Introduction to a sense of the largeness of, and initial familiarity with, large numbers upto 8 digits and approximation of large numbers)

**(ii) *Playing with Numbers:***

Simplification of brackets, Multiples and factors, divisibility rule of 2, 3, 4, 5, 6, 8, 9, 10, 11. (All these through observing patterns. Children would be helped in deducing some and then asked to derive some that are a combination of the basic patterns of divisibility.) Even/odd and prime/composite numbers, Co-prime numbers, prime factorisation, every number can be written as products of prime factors. HCF and LCM, prime factorization and division method for HCF and LCM, the property  $\text{LCM} \times \text{HCF} = \text{product of two numbers}$ . All this is to be embedded in contexts that bring out the significance and provide motivation to the child for learning these ideas.

**(iii) *Whole numbers***

Natural numbers, whole numbers, properties of numbers (commutative, associative, distributive, additive identity, multiplicative identity), number line. Seeing patterns, identifying and formulating rules to be done by children. (*As familiarity with algebra grows, the child can express the generic pattern.*)

**(iv) *Negative Numbers and Integers***

How negative numbers arise, models of negative numbers, connection to daily life, ordering of negative numbers, representation of negative numbers on number line. *Children to see patterns, identify and formulate rules.* What are integers, identification of integers on the number line, operation of addition and subtraction of integers, showing the operations on the number line (addition of negative integer reduces the value of the number) comparison of integers, ordering of integers.

**(v) *Fractions:***

Revision of what a fraction is, Fraction as a part of whole, Representation of fractions (pictorially and on number line), fraction as a division, proper, improper & mixed fractions, equivalent fractions, comparison of fractions, addition and subtraction of



fractions (Avoid large and complicated unnecessary tasks). (Moving towards abstraction infractions)

Review of the idea of a decimal *fraction*, place value in the context of decimal *fraction*, inter conversion of fractions and decimal fractions (avoid recurring decimals at this stage), word problems involving addition and subtraction of decimals (two operations together on money, mass, length and temperature)

## ALGEBRA

(15 hrs)

### *Introduction to Algebra*

- Introduction to variable through patterns and through appropriate word problems and generalisations (example  $5 \times 1 = 5$  etc.)
- Generate such patterns with more examples.
- Introduction to unknowns through examples with simple contexts (single operations)

## RATIO AND PROPORTION

(15 hrs)

- Concept of Ratio
- Proportion as equality of two ratios
- Unitary method (with only direct variation implied)
- Word problems

## GEOMETRY

(65 hrs)

### (i) *Basic geometrical ideas (2-D):*

Introduction to geometry. Its linkage with and reflection in everyday experience.

- Line, line segment, ray.
- Open and closed figures.
- Interior and exterior of *closed*
- figures. Curvilinear and linear *boundaries*
- Angle — Vertex, arm, interior and exterior,
- Triangle—vertices, sides, angles, interior and exterior, altitude and median
- Quadrilateral — Sides, vertices, angles, diagonals, adjacent sides and opposite sides (only convex quadrilateral are to be discussed), interior and exterior of a quadrilateral.

- Circle — Centre, radius, diameter, arc, sector, chord, segment, semicircle, circumference, interior and exterior.

**(ii) *Understanding Elementary Shapes (2-D and 3-D):***

- Measure of Line segment
- Measure of angles
- Pair of lines
  - Intersecting and perpendicular lines
  - Parallel lines
- Types of angles – acute, obtuse, right, straight, reflex, complete and zero angle.
- *Classification* of triangles (*on the basis of* sides, and of angles)
- Types of quadrilaterals– Trapezium, parallelogram, rectangle, square, rhombus.
- Simple polygons (*introduction*) (Upto octagons regulars as well as non-regular).
- *Identification of* 3-D shapes: Cubes,
- Cuboids, cylinder, sphere, cone prism (triangular), pyramid (triangular and square) Identification and locating in the surroundings
- Elements of 3-D figures. (Faces, Edges and vertices)
- Nets for cube, cuboids, cylinders, cones and tetrahedrons.

**(iii) *Symmetry: (reflection)***

- Observation and identification of 2-D symmetrical objects for reflection symmetry
- Operation of reflection (taking mirror images) of simple 2-D objects
- Recognising reflection symmetry (identifying axes)

**(iv) *Constructions (using Straight Edge Scale, protractor, compasses)***

- Drawing of a line segment
- Construction of circle
- Perpendicular bisector Construction of angles (using protractor)
- Angle  $60^\circ$ ,  $120^\circ$  (Using Compasses)
- Angle bisector- making angles of  $30^\circ$ ,  $45^\circ$ ,  $90^\circ$  etc. (using compasses)
- Angle equal to a given angle (using compass)

- Drawing a line perpendicular to a given line from a point 'a' on the line 'b' outside the line.

## MENSURATION

(15 hrs)

### Concept of Perimeter and Introduction to Area

Introduction and general understanding of *perimeter* using many shapes. Shapes of different kinds with the same perimeter. Concept of area, Area of a rectangle and a square *Counter examples to different misconcepts related to perimeter and area.*

Perimeter of a rectangle – and its special case – a square. Deducing the formula of the perimeter for a rectangle and then a square through pattern and generalisation.

## DATA HANDLING

(10 hrs)

- What is data – choosing data to examine a hypothesis?
- Collection and organisation of data - examples of organising it in tally bars and a table.
- Pictograph-Need for scaling in pictographs interpretation & construction.
- Making bar graphs for given data interpreting bar graphs+.

## CLASS VII

### NUMBER SYSTEM

(50 hrs)

#### (i) *Knowing our Numbers: Integers*

- Multiplication and division of integers (through patterns). Division by zero is meaningless
- Properties of integers (including identities for addition & multiplication, *commutative, associative, distributive*) (through patterns). These would include examples from whole numbers as well. Involve expressing commutative and associative properties in a general *form*. Construction of counter-examples, including some by children. Counter examples like subtraction is not commutative.
- Word problems including integers (all operations)

(ii) *Fractions and rational numbers:*

- Multiplication of fractions
- Fraction as an operator
- Reciprocal of a fraction
- Division of fractions
- Word problems involving mixed fractions
- Introduction to rational numbers (with representation on number line)
- Operations on rational numbers (all operations)
- Representation of rational number as a decimal.
- Word problems on rational numbers (all operations)
- Multiplication and division of decimal fractions
- Conversion of units (length & mass)
- Word problems (including all operations)

(iii) *Powers:*

- Exponents only natural numbers.
- Laws of exponents (through observing patterns to arrive at generalisation.)

$$(i) \quad a^m \cdot a^n = a^{m+n}$$

$$(ii) \quad (a^m)^n = a^{mn}$$

$$(iii) \quad \frac{a^m}{a^n} = a^{m-n}, \quad \text{where } m - n \in N$$

$$(iv) \quad a^m \cdot b^m = (ab)^m$$

ALGEBRA

(20 hrs)

**Algebraic Expressions**

- Generate algebraic expressions (simple) involving one or two variables
- Identifying constants, coefficient, powers
- Like and unlike terms, degree of expressions e.g:  $x^2y$  etc.
- (exponent  $\leq 3$ , number of variables)
- Addition, subtraction of algebraic expressions (coefficients should be integers).

- Simple linear equations in one variable (in contextual problems) with two operations (avoid complicated coefficients)

## RATIO AND PROPORTION

(20 hrs)

- Ratio and proportion(revision)
- Unitary method continued, consolidation, general expression.
- Percentage- an introduction.
- Understanding percentage as a fraction with denominator 100
- Converting fractions and decimals into percentage and vice-versa.
- Application to profit and loss (single transaction only)
- Application to simple interest (time period in complete years).

## GEOMETRY

(60 hrs)

### (i) *Understanding shapes:*

- Pairs of angles (linear, supplementary, complementary, adjacent, vertically opposite) (verification and simple proof of vertically opposite angles)
- Properties of parallel lines with transversal (alternate corresponding, interior, exterior angles)

### (ii) *Properties of triangles:*

- Angle sum property (with notions of proof & verification through paper folding, proofs using property of parallel lines, difference between proof and verification.)
- Exterior angle property
- Sum of two sides of a  $\triangle$  is greater than its third side
- Pythagoras Theorem (Verification only)

### (iii) *Symmetry*

- Recalling reflection symmetry
- Idea of rotational symmetry, observations of rotational symmetry of 2-D objects. ( $90^\circ$ ,  $120^\circ$ ,  $180^\circ$ )
- Operation of rotation through  $90^\circ$  and  $180^\circ$  of simple figures.

- Examples of figures with both rotation and reflection symmetry (both operations)
- Examples of figures that have reflection and rotation symmetry and vice-versa

**(iv) *Representing 3-D in 2-D:***

- Drawing 3-D figures in 2-D showing hidden faces.
- Identification and counting of vertices, edges, faces, nets (for cubes cuboids, and cylinders, cones).
- Matching pictures with objects (Identifying names)
- Mapping the space around approximately through visual estimation.

**(v) *Congruence***

- Congruence through superposition (examples- blades, stamps, etc.)
- Extend congruence to simple geometrical shapes e.g. triangles, circles.
- Criteria of congruence (by verification) SSS, SAS, ASA, RHS

**(vi) *Construction (Using scale, protractor, compass)***

- Construction of a line parallel to a given line from a point outside it. (Simple proof as remark with the reasoning of alternate angles)
- Construction of simple triangles. Like given three sides, given a side and two angles on it, given two sides and the angle between them.

**MENSURATION**

**(15 hrs)**

- Revision of perimeter, Idea of Circumference of Circle

***Area***

Concept of measurement using a basic unit are a of a square, rectangle, triangle, parallelogram and circle, area between two rectangles and two concentric circles.

**DATA HANDLING**

**(15 hrs)**

- Collection and organisation of data – choosing the data to collect for a hypothesis testing.
- Mean, median and mode of ungrouped data–understanding what they represent.
- Constructing bar graphs

- Feel of probability using data through experiments. Notion of chance in events like tossing coins, dice etc. Tabulating and counting occurrences of 1 through 6 in a number of throws. Comparing the observation with that for a coin. Observing strings of throws, notion of randomness

## CLASS VIII

### NUMBER SYSTEM

(50 hrs)

#### (i) *Rational Numbers:*

- Properties of rational numbers. (including identities). Using general form of expression to describe properties
- Consolidation of operations on rational numbers.
- Representation of rational numbers on the number line
- Between any two rational numbers there lies another rational number (Making children see that if we take two rational numbers then unlike for whole numbers, in this case you can keep finding more and more numbers that lie between them.)
- Word problem (higher logic, two operations, including ideas like area)

#### (ii) *Powers*

- Integers as exponents.
- Laws of exponents with integral powers

#### (iii) *Squares, Square roots, Cubes, Cube roots.*

- Square and Square roots
- Square roots using factor method and division method for numbers containing (a) no more than total 4 digits and (b) no more than 2 decimal places
- Cubes and cubes roots (only factor method for numbers containing at most 3 digits)
- Estimating square roots and cube roots. Learning the process of moving nearer to the required number.

**(iv) *Playing with numbers***

- Writing and understanding a 2 and 3-digit number *in generalized form* ( $100a + 10b + c$ , where  $a, b, c$  can be only digit 0-9) and engaging with various puzzles concerning this. (Like finding the missing numerals represented by alphabets in sums involving any of the four operations.) Children to solve and create problems and puzzles.
- Number puzzles and games
- Deducing the divisibility test rules of 2, 3, 5, 9, 10 for a two or three-digit number expressed in the general form.

**ALGEBRA**

**(20 hrs)**

***Algebraic Expressions***

- Multiplication and division of algebraic expressions (Coefficient should be integers)
- Some common errors (e.g.  $2 + x \neq 2x$ ,  $7x + y \neq 7xy$ )
- Identities  $(a \pm b)^2 = a^2 \pm 2ab + b^2$ ,  $a^2 - b^2 = (a - b)(a + b)$  Factorisation (simple cases only) as examples the following types  $a(x + y)$ ,  $(x \pm y)^2$ ,  $a^2 - b^2$ ,  $(x + a)(x + b)$
- Solving linear equations in one variable in contextual problems involving multiplication and division (word problems) (avoid complex coefficient in the equations)

**RATIO AND PROPORTION**

**(25 hrs)**

- Slightly advanced problems involving applications on percentages, profit & loss, overhead expenses, Discount, tax.
- Difference between simple and compound interest (compounded yearly up to 3 years or half – yearly upto 3 steps only), Arriving at the formula for compound interest through patterns and using it for simple problems.
- Direct variation – Simple and direct word problems
- Inverse variation – Simple and direct word problems
- Time & work problems – Simple and direct word problems



**GEOMETRY****(40 hrs)****(i) Understanding shapes:**

- Properties of quadrilaterals – Sum of angles of a quadrilateral is equal to  $360^\circ$  (By verification)
- Properties of parallelogram (By verification)
  - Opposite sides of a parallelogram are equal,
  - Opposite angles of a parallelogram are equal,
  - Diagonals of a parallelogram bisect each other. [Why (iv), (v) and (vi) follow from (ii)]
  - Diagonals of a rectangle are equal and bisect each other.
  - Diagonals of a rhombus bisect each other at right angles.
  - Diagonals of a square are equal and bisect each other at right angles.

**(ii) Representing 3-D in 2-D**

- Identify and Match pictures with objects [more complicated e.g. nested, joint 2-D and 3-D shapes (not more than 2)].
- Drawing 2-D representation of 3-D objects (Continued and extended)
- Counting vertices, edges & faces & verifying Euler's relation for 3-D figures with flat faces (cubes, cuboids, tetrahedrons, prisms and pyramids)

**(iii) Construction:***Construction of Quadrilaterals:*

- Given four sides and one diagonal
- Three sides and two diagonals
- Three sides and two included angles
- Two adjacent sides and three angles

**MENSURATION****(15 hrs)**

Area of a trapezium and a polygon.

- Concept of volume, measurement of volume using a basic unit, volume of a cube, cuboid and cylinder.
- Volume and capacity (measurement of capacity)

- Surface area of a cube, cuboid, cylinder.

## **DATA HANDLING**

**(15 hrs)**

- Reading bar-graphs, ungrouped data, arranging it into groups, representation of grouped data through bar-graphs, constructing and interpreting bar-graphs.
- Simple Pie charts with reasonable data numbers
- Consolidating and generalising the notion of chance in events like tossing coins, dice etc. Relating it to chance in life events. Visual representation of frequency outcomes of repeated throws of the same kind of coins or dice.
- Throwing a large number of identical dice/coins together and aggregating the result of the throws to get large number of individual events. Observing the aggregating numbers over a large number of repeated events. Comparing with the data for a coin. Observing strings of throws, notion of randomness.

## **INTRODUCTION TO GRAPHS**

**(15 hrs)**

### ***Preliminaries:***

- Axes (Same units), Cartesian Plane
- Plotting points for different kind of situations (perimeter vs length for squares, area as a function of side of a square, plotting of multiples of different numbers, simple interest vs number of years etc.)
- Reading off from the graphs
  - Reading of linear graphs
  - Reading of distance vs time graph

## ENVIRONMENTAL STUDIES

### *Themes for a Child Centered and Integrated Approach*

This syllabus web has been developed within a child centered perspective of themes that provide a common interface of issues in social studies, sciences and environmental education. The syllabus for Classes III – V is woven around six common themes given below; the predominant theme on ‘Family and Friends’ encompasses four sub-themes:

1. Family and Friends:
  - 1.1 Relationships;
  - 1.2 Work and Play;
  - 1.3 Animals;
  - 1.4 Plants
2. Food;
3. Shelter;
4. Water;
5. Travel;
6. Things We Make and Do

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.

The theme on ‘**Travel**’ was developed to help the child on this journey of ideas, of expanding social and physical spaces, into newer and unfamiliar terrains of often mind-boggling and no less fascinating diversity. In Class III the theme encourages children to look at their own journeys, if any, and to see how older people in their family may have traveled in earlier times, as they also hear of accounts of how people travel today in a desert, through forests, in the hills, or in big cities. Moreover, it also suggests a story as a ‘resource’, to bring into the classroom the experiences of a child of a migrating family and the problems she faces in the process of her schooling. Such narratives suggested as ‘resources’ are meant to provide creative opportunities of bringing in experiences of other children/people, who may be very different, but whom children can relate to. This can be done through stories, posters, plays, films, and other media. In Class V the theme ‘Travel’ takes children through the ‘**rough and tough**’ terrain of the Himalayas with, perhaps, the story of Bachhendri Pal, who hoists the national flag after a trying expedition, while they can also be encouraged to design a flag for their own school.

This theme also takes them on a ‘**ride on a spacecraft**’ into space, from where for the first time they see the aerial view of the earth, and being no less than a Rakesh Sharma or a Kalpana Chawla, each child is asked to give an interview to the Prime Minister of India about what they see from there! The exercise of looking at aerial views is developed through different views of school, where different perspectives get introduced. It is linked to the concept of mapping, which they begin in Class III through a basic two-dimensional representation of their classroom, and by the time they reach Class V they can read and draw simple aerial views of their locality or city.

### *‘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’.

It is a challenge to transcend conventional boundaries of scientific disciplines to try and relook at the notions of, say, ‘plants’, ‘animals’, ‘food’, or ‘our body’ from a child’s perspective. In fact, some scientific categories are seen to be too formal and counter-intuitive, and perhaps even ‘reductionist’, for the child to understand. Conventionally biologists divide living things broadly into two categories ‘plants’ and ‘animals’. The idea of ‘plants’ is considered simple enough to be presented in primary school along with ‘parts of a plant’, ‘functions of the parts of the plant’, etc. But why should this way of looking at a plant be considered more ‘natural’ or even desirable for a child? In fact, extensive research across the world has shown that young children find it too abstract to make a distinction between living and non-living, or to divide the living world between plants and animals. Despite considerable exposure to science teaching in several countries, children as old as 13-15 years have consistently believed that a tree is different from a plant, contradicting the conventional categories of biologists’. Children also systematically differentiate between plants and vegetables (‘a carrot and cabbage are not plants’), or even between plants and weeds (‘grass is not a plant’). Moreover, a majority of children do not naturally think of seeds as parts of a plant. This has led some primary school curricula to postpone these conventional categories and first allow space to children to explore their own intuitive ideas, in order to achieve a better understanding later of how science tends to classify them differently.

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 sensitize 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, Ourselves: 'Family and Friends' offer Sensitivity and Sensibility***

Similar to the case of 'plants' discussed above, traditionally 'our body' is also treated in a purely scientific and socially distanced manner, with units such as 'our senses', 'parts/organs of the body' and 'respiration', 'digestion', etc. However, the theme **'Family and Friends'**, specially through its two sub-themes **1.1 Relationships** and **1.2 Work and Play**, allows children to look at their own body as part of their 'self' in a more contextual and connected manner. In Class III in the sub-theme on Relationships, they discuss their relatives, who live with them and those who have moved away, to get a basic idea of relationships and changing households. They reflect on whom they admire among their relatives and for what qualities or skills, and describe on which occasions or festivals they meet most of them. The unit **'our bodies – old and young'** helps them place their own body in relation to those of their family members, and asks them to notice differences that may occur with age. More significantly, the rubric of the family provides a sense of intimacy and empathy, to help develop sensitivity towards people having different abilities/disabilities. For instance, they look at how some of their older family members may have difficulty in hearing or seeing, and then go on to discuss how they themselves or their friends may cope with such challenges.

In Class IV, the same sub-theme 'Relationships' has a unit on **'your mother as a child'** to make children find out about who were her relatives with whom she lived then. They also think about their body in relation to their mother's; how a baby rat or kitten is related to its mother, and through a possible narrative, about children who may have been adopted/looked after by foster parents, say, after a cyclone. 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. They continue the exploration of feeling what is smooth/rough, hot/cold, wet/dry, sticky/slippery, etc. and are asked to think if there are some things (or people) they are not allowed to touch. This unit also attempts to make them sensitive to the fact that while touch can mean both a caress and a painful slap, the caress too can be a 'good' touch or a 'bad' touch.

In Class V, the unit '**Whom do I look like?**' helps them identify family resemblances, to look for any similarities in the face, voice, height, etc., and also to note particular traits such as 'who laughs the loudest?'. It goes on to how by '**feeling to read**' on a Braille sheet, someone like Helen Keller could manage to overcome tremendous challenges, as described through accounts of her autobiography.

'Family and Friends' has another sub-theme **1.2 'Work and Play'** through which they explore different patterns of activity when people are working and 'not-working' in their family and neighbourhood. This helps them to sensitively look at stereotyped gender roles, and to compare their own daily routine with that of a working child. It also allows them to analyse the games they play, to see how traditional games or toys have changed since the time their grandparents were young. In Class V this sub-theme looks at '**team games - your heroes**' and also martial arts or wrestlers and how they are trained. An exploration of our bodies and the process of respiration naturally falls into this context, and in '**blow hot blow cold**' they compare how much faster they breathe after a run. They also see how much they can expand their chest, how they blow on a glass to make it cloudy, and blow to warm their cold hands and also to cool something hot. As suggested this unit could make use of the beautiful story by Dr. Zakir Hussain, '**Usee Se Thanda Usee Se Garam**' as a resource. The unit 'clean work, dirty work' sensitizes them to the dignity of labour and how different people's work provides essential services to society, possibly through a narrative/story based on Gandhi's work.

### ***Things we Make and Do***

The area of **Things we Make and Do** is visualised as an important component as well as a common thread inherent in the process of understanding all the other themes. We humans make things not only to meet our needs but also to express ourselves in a variety of ways and to transcend our limitations. We also comprehend better when we do things ourselves. Often when a young child gets a toy for a gift, she has fun

dismantling and later re-assembling it in a completely novel way as much as enjoying it as it is. When she is given a new book she is eager to add 'her pictures' into it as much as appreciating the book. Formal education as well as all that goes into 'being a good child' however discourages these acts. The theme of Things we Make and Do therefore is an opportunity to recharge the variety of energies/components that make learning more fulfilling, and where cognition is not an end but a process enriched by experience, failure, observation, success, etc. There is also a need to give our rich living traditions of art and craft, of 'making and doing things', their rightful place in our curricula.

Another aspect related with this theme is to understand the significance of design and technology in relation to science and society. Technology is not merely applied science; it has an independent existence and in many cases predates developments in science. Moreover, most of the things we make and do also depend on raw materials and interventions that impact the earth and life on earth.

This theme will also help address the issue of dignity of physical labour. A young child loves sweeping, wanting to help the mother in the household chores, loves fiddling with any electrical appliance within her reach. However, she soon begins to ascribe value to these things that she once enjoyed doing. Sweeping becomes dirty, and to be done by servants or women in the house, fiddling with implements becomes an area reserved for men and boys. In short work becomes a way to segregate people, to judge them, to ascribe it to a particular gender, class or caste. Mahatma Gandhi's vision and plan of 'Basic Education' had the potential to overcome these fractures. The present syllabus takes a small step in that direction, while encompassing contemporary concerns relating to environmental education, social relations with a vision for sustainable development and appropriate technologies.

It needs to be emphasised that the syllabus has consciously included key questions that openly address issues of inequality or difference and encourage children to think critically. Whether it is about social discrimination in school or in getting water, about physically challenged people, or working children, all these issues are part of the reality of children, especially those who are disadvantaged and therefore more vulnerable to be pushed out of school. The objectives clearly stress the need to enable children to articulate and critically reflect on these lived experiences, however unpleasant, and not promote a culture of evasion or silence in school. This calls for a specially sensitive approach in textbooks as well as in the teaching learning process in classrooms, and teachers will need to review how they can do justice to these questions.



### ***Scaffolding Children's Learning: The Question Format of the Syllabus***

Since the 1970s the philosophy of primary education in different countries, including ours, has been influenced by the Chinese saying “I do, I understand”. This lays emphasis on the principle of ‘learning by doing’, which suggests that learners actively construct their understanding while directly interacting with their environment. However, this model of learning looks at each learner as a solitary individual – it is the “I” who is trying to understand, struggling to develop each concept. This approach is associated with the ‘cognitive constructivist psychology’ of Piaget, and implies that teachers can only provide a stimulating environment for children to develop. This also suggests that children need to be nurtured individually like delicate plants, as they develop naturally through successive stages of intellectual development. However, in the last few decades it has been increasingly seen that children do not learn alone, through interaction with the environment, but learn more through talking and discussing with other people, both adults and other children. This psychological approach known as ‘social constructivism’ has been influenced by the work of Vygotsky and Bruner, who showed that adult support is crucial to children’s thinking. With an appropriate question or suggestion, the child’s understanding can be extended far beyond the point which she could have reached alone. In fact, it has been shown that through the ‘scaffolding’ provided by such questions, discussions, and adult support, the child can be helped to cross what is called ‘the zone of proximal development’ to leap to the next level of understanding. The present syllabus is framed within this social constructivist perspective of learning. It is hoped that children will be supported to construct knowledge far beyond their individual abilities through appropriate questions and interventions, including discussions with adults, in school and also at home, as also among themselves. *Instead of listing key concepts the syllabus begins by suggesting some key questions, framed in a language appropriate to stimulate the thinking of a child that age.* These are not meant to be questions of the textbook but are suggestive of the nature of scaffolding to be provided to help children think in certain directions. This is especially important to help children articulate their own ideas, for instance, in the case of what they understand by the term ‘plants’ or ‘animals’. Textbooks written in different contexts and regions will be different and indeed must reflect their own specific concerns. However, such questions are important for textbook writers to know how to guide children to observe, compare, predict or analyse certain phenomena or processes. For instance, in the theme on Food, there is a question “Who provides us the Mid-Day Meal?” This is a leading question to encourage children to begin thinking about the

agencies and institutions who provide certain services, beyond the concrete observation of the particular person. Thus as they begin to think about the post office or the school or hospital as institutions, it will help them in developing the abstract concept about the notion of governance or ‘government’, which they normally encounter later usually in the form of statements or information that they are totally unable to comprehend. Thus when appropriate connections and linkages are made in the child’s mind about her own immediate experiences she is enabled to understand more abstract or sophisticated concepts and arguments later.

The matrix of each theme contains leading questions and key concepts and also suggested resources and activities. As the name indicates, these are purely suggestive for teachers and textbook writers, to give an idea of how the particular theme can be dealt with. It is clear that different textbooks based on this syllabus structure can turn out to be very diverse in terms of the elaboration of the themes. Just as every structure must have its own foundations and its own stability, similarly each child ultimately needs to construct her own understanding, articulation, knowledge and skills. We do know that children are not blank slates or empty vessels to be filled by ‘information’ about carefully listed key concepts, and that they cannot learn by passively listening to adults, however expressive they may be. This is the basic problem of our traditional system which relies on giving ‘information’, justified on whatever grounds, but without caring to know about the possible zone of the child’s development. Indeed there is no getting away from this: If children have to understand an idea they have to construct knowledge for themselves, which can happen when they get the right cues to connect new understanding with what they already possess. This syllabus identifies those cues that will help children connect with their varied knowledge systems. Our children do indeed know and can learn a lot; it is our responsibility to help them do it better.

### ***What Learning Do We Expect?***

How can Environmental Studies help *all* our children, all those who struggle to go to school, and even all those who still cannot do so; those for whom the main purpose in life is going to school, as well as those who aspire for a school that can support life, with meaning and dignity? This document gives a suggestive matrix of themes and sub-themes through the three years of Classes III – V. It is up to the teachers and textbook writers to translate this into books, materials and classroom activities, to shape an enabling *learning environment* for each child, wherever she may be located. Even in the earlier years children do learn about their environment, though there is no separate

subject in school. It is expected that in Classes I-II the two subjects of Language and Mathematics will incorporate some themes for the development of concepts and skills in areas broadly related to EVS.

This syllabus format consciously does not spell out any outcomes for each theme. For each thematic area related key concepts, skills and activities have been clearly indicated at appropriate places. However, schools must ensure that these activities or discussions will be conducted because only then can it be ensured that learning will happen. For instance, at several places the activities indicate that children need to conduct specific observations. We know that even young children's senses are sharp and they are able to detect small differences between fairly similar objects, though not always the similarities. However, the purpose of conducting 'observation' activities in EVS is usually not to collect random similarities or differences, but to *seek information from the object to extend children's ideas and understanding*. For instance, to look specifically at the shapes of leaves, the edges, the patterns of lines in it, etc. to know more about them. Thus *specific purposes will need to be spelt out when activities are designed*. Similarly, young children ask many questions which help in their development, but which are not all deep, and which do not allow them to understand things at that stage. However, *EVS classrooms will need to provide opportunities to children to be able to progressively ask higher order questions* that require different levels of reasoning and investigation, by planned activities and exercises to get them to phrase their questions, to answer, discuss and investigate them. These are basic to the learning process in EVS and yet, unfortunately, most classrooms are not designed to ensure this. How then can we expect all children to learn? What then does it mean to specify any outcomes at this point?

We reiterate the purpose in drafting this syllabus through the following example:

### ***What biology do students know?***

Janabai lives in a small hamlet in the Sahyadri hills. She helps her parents in their seasonal work of rice and 'tuar' farming. She sometimes accompanies her brother in taking the goats to graze. She has helped bring up her younger sister. Nowadays she walks 8 km everyday to attend the nearest secondary school.

She maintains intimate links with her natural environment. She has used different plants as sources of food, medicines, fuel wood, dyes, and building materials; she has observed parts of different plants used for household purposes, religious rituals and in celebrating festivals. She recognises minute differences between trees, and

notices seasonal changes based on shape, size, distribution of leaves and flowers, smells and textures. She can identify about a hundred different types of plants around her, many times more than her biology teacher can – the same teacher who believes Janabai is a poor student; that “These students don’t understand science ... they come from a deprived background!”

Can we help Janabai translate her rich understanding into formal concepts of biology? Can we convince her that school science is not about some abstract world coded in long texts and difficult language: it is about the farm she works on, the animals she knows and takes care of, the woods that she walks through everyday? (*National Curriculum Framework 2005, p. 45*)

### CLASS V

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<b>1. Family and Friends</b> <b>1.1 Relationships</b> <i>Family tree</i> Can you make a family tree with as many of your relatives you can get information about? Who are the relatives whom you have never seen? Where do they live?	Family in transition – Impact of larger socioeconomic forces are changing family structure and quality of life in families; Idea about several generations; how some people move away, some continue to live together, and how households get formed/reformed at several places. How these are affecting roles, relationships, value systems,	A story woven around a family tree with old family photographs.	Activity - Write the names of all your family members along with their ages. How many generations have you been able to get details about?

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p><i>Shifting from place to place</i></p> <p>Have you always lived at the place that you now live in? If not, where does your family come from?</p>	<p>aspirations within a family.</p> <p>Shifts in habitation migration/transfers/ demolition displacement Associated difficulties</p>	<p>Story of a migrating family or a family displaced by the construction of a dam or demolition of an urban slum.</p>	<p>Discussion or letter writing; drawing.</p>
<p><i>Who laughs the loudest?</i></p> <p>Who is the tallest/shortest in the family? Who has the longest hair? How long? Who has the loudest voice/laugh in the house? From how far away can you hear it? Who speaks the softest? When does a child cry the loudest? When she is hungry-or angry? Who is the best cook in the family?</p>	<p>Basic ideas of measurement - of height; Observing and appreciating qualities and skills of relatives; observing infants.</p>	<p>Cartoons; narratives.</p>	<p>Mimicking people in the family – laugh and voices; drawing people in the family. Writing exercises about an infant they have observed.</p>
<p><i>Our likes and dislikes</i></p> <p>Which is your favourite colour? Which is your</p>	<p>Our bodies, our senses, our likes/ dislikes vary e.g. our</p>	<p>Narratives about preferences in taste, smells, colours in</p>	<p>Observation, discussion, describing and</p>

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p>friend's favourite colour? Which is your favourite food? What about your friends favourite food? Do you know your friends' likes and dislikes? Are there any smells you don't like (fish, mustard oils, garlic, eggs etc.)? Do you eat fish?</p>	<p>concept of foul/fragrant smell <i>Cultural influences of taste, smell, etc. (to be discussed without stereotyping).</i></p>	<p>different cultural context.</p>	<p>writing about a friend's likes/dislikes; a class survey about childrens favourite colour/food etc.</p>
<p><b>Feeling to read</b> Do you know how people read with their hands? Do you know someone who finds it difficult to walk/ speak/see etc.? How do you think they learn to overcome the problem?</p>	<p>Awareness and sensitization towards the problems of physically challenged;</p>	<p>Autobiography of Helen Keller; excerpt from her teacher's account of how she learnt; Braille sheet.</p>	<p>Activity with Braille paper (or simulated Braille paper).</p>
<p><b>1.2 Work and Play</b> <b>Team games – your heroes</b> Do you play any games in teams? Have you ever been captain of the team? Do boys and girls</p>	<p>Types of games/sports, importance of team spirit in games, gender stereotyping. Some</p>	<p>Library resources- Indian cricket team; narrative about some national and international players.</p>	<p>Collecting information, making picture albums; posters of sports persons.</p>

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p>play together? Have you heard of any Indian team playing in another country? Which is your favourite team sport? Do you know any National level player?</p> <p><b>Local games/ martial arts</b></p> <p>What are the local games/ martial arts of your area? Do you know someone who is good at them? Have you seen a young acrobat or wrestler practicing? Who taught them? For how long have they learnt the art/game? What are the new games in your area that were not played earlier?</p> <p>What do you do in the evenings for leisure? What if there is no TV? Who decides what programmes to watch?</p>	<p>idea of other countries and national teams. Gender, class stereotyping in play.</p> <p>Local and traditional martial art forms/ games. Typical practice routines; teachers/gurus; changing patterns of local games.</p> <p>Changing nature of leisure.</p>	<p>Description or photographs of traditional martial arts, 'Nat', acrobat, boat race, etc.</p>	<p>Reading, discussion, collecting information and writing about local/martial games.</p>

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p><b><i>Blow hot blow cold</i></b> How many times do you breathe in a minute – on sitting still, just after a run? How much can you expand your chest by breathing deeply? Can you make a glass cloudy by blowing on it? How do you blow to make something cold? Do you also blow to keep a fire going?</p>	<p>Our breathing – estimates of different rates; chest expansion and contraction in the child's body while exhaling and inhaling; My breath – hot and humid; tacit understanding of cooling by blowing and helping a fire to burn.</p>	<p>Story by Zakir Hussain – “<i>Usee se thanda usee se garam</i>” – Zubaan books.</p>	<p>Observation, activity of breathing in and out and observing the difference (mirror/glass/on palm); measuring chest; counting heart beat and breathing rate, making and using a stethoscope.</p>
<p><b><i>Clean work – dirty work?</i></b> 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>Dignity of Labour Dependence of society on such essential services. Choice of work as a societal value.</p>	<p>Extract from Gandhi's autobiography; narrative from another country - sweepers treated with dignity; story of a Valmiki boy discriminated in school because of parents' occupation.</p>	<p>Reading and discussion based on suggested resources.</p>



Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p><b>1.3 Animals</b></p> <p><i>How animals find their food?</i></p> <p>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><i>What we take from animals?</i></p> <p>What animal products do we use for clothing, shelter, etc.?</p> <p><i>Why is the tiger in danger?</i></p> <p>Why do people kill wild animals? Which are the animals that are poached?</p> <p><i>People who depend on animals</i></p> <p>Do you know people who catch/trap/hunt/entertain using</p>	<p>Sense organs; Comparison with humans – activities such as eating sleeping etc.</p> <p>Animal products used by us.</p> <p>Protection of wild life; selling of animal parts.</p> <p>Communities dependent upon animals; hunters restricted to smaller</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>Child's daily life experience, information about products we obtain from animals.</p> <p>Excerpt from 'Man eaters of Kumaon' by Corbet.</p> <p>Library resources; illustrations of pre-historic hunting scenes (Bhimbetka).</p>	<p>Observation of animals to study their response sound, food, light and other stimuli.</p> <p>Listing and drawing of items made from animal products.</p> <p>Discussion, reading, poster making activity with a message to save wild life.</p> <p>Discussion on people whose livelihood depend on animals; drawing;</p>

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p>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><b>1.4 Plants</b> <b><i>Growing plants</i></b> How does a plant grow from a seed? Can you grow a plant without seeds? How do you grow mangoes/potatoes? Where does the seed come from? Have you seen seeds that fly/stick to your clothes/drift in the water?</p>	<p>spaces; changing patterns of wild and domestic animals. To be sensitive about cruelty to animals; realize that people who depend on animals for their livelihood are not necessarily cruel to them. Basic idea of pre-historic hunters and the wild animals seen at that time.</p> <p>Seed germination, root and shoot axis, baby plant, storage of food in the seed; seed dispersal.</p>	<p>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>Seeds, germinated seeds.</p>	<p>Discussion on people teasing/troubling animals at the zoo/other places.</p> <p>Study germination of some seeds, experiment to determine conditions suitable for germination (air and water).</p>

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p><b><i>Forests and forest people</i></b></p> <p>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 products e.g., ‘<i>pattals</i>’, 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><b><i>Protected trees</i></b></p> <p>Have you heard of a park/sanctuary? Who looks after it? Does anybody own it? Have you seen a place where trees are worshiped 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>

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p><i>Plants that have come from far</i></p> <p>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: “ <i>Alu, mirchi, chajji, Kaun kaban se aye ji</i> ” Story about the Chinar tree coming to Kashmir.	Local knowledge, reading, and discussion, reciting the poem together; making tea.
<p><b>2. Food</b></p> <p><i>When food gets spoilt</i></p> <p>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.

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p><b><i>Who produces the food we eat?</i></b> 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><b><i>What did people grow earlier?</i></b> 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 kinds 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><b><i>When people do not get food</i></b> 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</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 man-made calamity; TV news bulletins etc.	Collection of pictures related to natural calamities; discussion on affects.

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p>when you are hungry? Do you know of people who get ill because they do not have enough to eat?</p> <p><b><i>Our mouth – tastes and even digests food!</i></b> How do we taste food? What happens in the mouth to the food we eat? Why do we give glucose to patients? What is glucose?</p> <p><b><i>Food for plants?</i></b> 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><b>3. Shelter</b> <b><i>Why different houses</i></b> Why do you have different kind of houses in different</p>	<p>Tasting food; chappati/ rice becomes sweeter on chewing; digestion begins in the mouth; glucose is a sugar.</p> <p>Water, manure, air for plants; Insectivorous plants e.g. pitcher plant, Venus fly trap; basic idea of food chain/web.</p> <p>Variation in shelter: regional difference, difference due to</p>	<p>Child's experience; some samples of food items; story of someone on a glucose drip.</p> <p>Pictures/visuals of insectivorous plants.</p> <p>Different houses in different climates and regions.</p>	<p>Tasting activity, action of saliva on rice/chappati.</p> <p>Observations and discussion on food for plants; making a model of a food chain/web.</p> <p>Making models of houses; collection of materials used to</p>

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p>places? Different houses in the same place?</p> <p><b><i>A shelter for everyone?</i></b> Does everyone have a shelter to live in? Why do people live together in villages, hamlets, colonies, neighborhoods?</p> <p><b><i>Ants live in colonies?</i></b> Do you know how bees/ ants live together in colonies?</p> <p><b><i>Times of emergency</i></b> 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</p>	<p>climate and materials available, economic status, etc.</p> <p>Need for living close to others, the idea of neighbourhoods. Need for sharing resources and spaces, division of spaces.</p> <p>Ant or bee colony, social behaviour in insects.</p> <p>Disaster and trauma of losing one's home; community help; Hospitals, police stations, ambulance, shelters, fire station, first aid.</p>	<p>Pictures of villages, colonies etc.</p> <p>A case study of social organisation in bees/ants.</p> <p>Newspaper clippings.</p>	<p>make houses in different places.</p> <p>Write and draw the area you live in, find out about people who work for everybody.</p> <p>Observations and drawings of ant colonies, different types of ants.</p> <p>Discussion, finding out about the hospital, police station, fire station, etc.</p>

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p>we look for help at such times? Who runs such institutions?</p> <p><b>4. Water</b></p> <p><i>Water from where in earlier times?</i></p> <p>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><i>Water flow</i></p> <p>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>Estimates of distance measurement; changes in sources and water availability over time; community service especially for long distance travellers.</p> <p>Sources for irrigation; different quantities of water for different crops; Different methods of lifting water; the use of a waterwheel.</p>	<p>Illustrations, story of a 'baoli'/stepwell.</p> <p>Farmer/any local person who works in fields, a plant/crop.</p>	<p>Enquiry from grandparents/other elders; drawing, model making of a step well.</p> <p>Interaction with a farmer, visit to a field, making water wheel., activity with water wheel.</p>



Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p><b><i>Plants and animals in water</i></b></p> <p>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><b><i>What floats, sinks or mixes?</i></b></p> <p>Have you ever seen anything floating in water? Can you classify as many things around you to see which float, which sink and which mix with water? Does oil mix with water? What are the similarities and differences in water, oil, milk, cold drink, etc.? How do we measure these?</p>	<p>Animals and plant life in water; classification in terms of similarities and differences.</p> <p>Basic observations and classification related to floatation and solubility in water; oil and water are liquids that do not mix; basic concepts about liquids; litre as unit of measurement of volume.</p>	<p>Weeds of different kinds; pictures of plants and animals living in different habitats.</p> <p>Various materials to experiment with, such as, sugar, stone, oil, salt, sand etc. Story of the donkey and the salt/cotton bag.</p>	<p>Listing and classification; drawing of water body.</p> <p>Hands-on activity to observe solubility in water, floatation; discussion, interpretation.</p>

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p><b><i>Mosquitoes and malaria</i></b></p> <p>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><b>5. Travel</b></p> <p><b><i>Petrol or diesel</i></b></p> <p>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>Poems and songs about trains/cars etc.; Enquiry from adults; the story of 'petrol'.</p>	<p>Discussion, finding out different fuels used, comparison of cost of petrol and diesel.</p>

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p><b><i>Rough and tough</i></b> 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>	Mountains, expeditions and the spirit of adventure; some idea of training for high altitude; national flag.	Excerpt from the autobiography of Bachendri Pal; Flag of India atop mount Everest; flags of some countries	Act/dance to show climbing on a difficult mountain; Designing a flag for your school; identifying some other flags
<p><b><i>Ride on a spacecraft</i></b> 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>	The sky in the day and night. Basic exposure to the aerial view of the earth and what India looks like from there.	Story of Rakesh Sharma/ Kalpana Chawla.	Observation from a terrace to draw its aerial view. Imagine yourself in a spacecraft giving an interview to the PM about what you see from there!
<p><b><i>Oldest buildings</i></b> Is there any well-known monument/ historical place in your area that people come to visit? What are the oldest buildings around your area? Have you traveled far to see any historical monuments? Have you heard of those personalities who lived in these</p>	Heritage buildings as a source of knowledge about our past; to be able to understand how they were built; materials used come from a variety of places, skills of the crafts person; Some historical personalities.	Oral narratives from people; pictures.	Drawing pictures of the building or the monument in your neighbourhood or memory or imagination.

Questions	Key Concepts/ Issues	Suggested Resources	Suggested Activities
<p>monuments or who built these?</p> <p><b>6. Things we Make and Do</b></p> <p><b><i>Growing Food</i></b></p> <p>How do we grow food? What tools do we use for preparing the field? For cutting and harvesting? For cutting and cooking different vegetables/dishes?</p> <p>How do we water the crops? How do we lift water through a pump or a waterwheel? Can we make a water wheel, sprinkler, etc.?</p>	<p>After basic needs met, exploration leading to improving and overcoming human limitations; greater expression of creativity; overuse of natural resources needs to be checked.</p> <p>Some idea of the story of a grain from the field to our plate – in terms of processes and the tools used.</p> <p>Different things made from the same grain, say, wheat/rice.</p> <p>Simple observations of water lifting in fields or in homes; making of a water wheel, sprinkler, etc.</p>	<p>Narratives; talking to elders, farmers, those involved in growing and cooking food.</p> <p><i>'Dum se pump'</i> by Arvind Gupta.</p>	<p>Observing and talking about processes of growing food; drawing tools used in different processes; finding out about different dishes made from the same grain, say, wheat/rice.</p> <p>Making a simple waterwheel, sprinkler, pump.</p>

## SOCIAL SCIENCE

### *Introduction*

The revised syllabus for the Social Sciences in Classes VI-XII attempts to advance an on-going process of assisting children and young people to understand that a healthy engagement with the world must come as much from the way society takes shape and functions as from a proper sense of its material and physical foundations. From this, it is expected, a vision will evolve that the Social Sciences provide both essential skills of comprehension that are fundamental to any activity, and a means of self-understanding and fulfillment that can be diverting, exciting and challenging. The syllabus assumes that the knowledge apparatus of the child and the young person is itself complex both given the wide range of materials that the visual and print media have drawn into country and urban life and the nature of the problems of everyday life. To negotiate the diversity and confusion and excitement the world throws up itself requires activity and insight that the Social Sciences can substantially provide. To have a firm and flexible perspective on India's past and the world from which, and in which, the country develops, sensitivity to crucial social problems is essential. The syllabus attempts to encourage such sensitivity and provide it with the ground on which it may deepen – stressing that attention should be paid to the means through which sensitivity and curiosity are aroused as much as the specific information that stimulates it.

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.

In Classes VI-X, this process continues, but with a greater attention to specific themes and with an eye to the disciplines through which Social Sciences perspectives have evolved. Up to a point, the subjects that are the focus of college-level teaching – History, Geography, Political Science, and Economics – are meant to take shape in the child's imagination during these years – but only in a manner where their boundaries are open to dispute, and their disciplinary quality is understated. With such intentions, syllabus-makers have been more concerned with theme and involvement rather than information. Textbook writers will be concerned to ensure that understanding does not suffer through suffocation by obsession with detail. Equally, the themes and details that

are brought before the child for attention and discussion are also meant to clarify doubts and disputes that take shape in contemporary society – through an involvement of the classroom in discussions and debates via the medium of the syllabus.

With such a focus in mind, syllabus-makers for the Upper Primary and Secondary Stages have sought to ensure that their course content overlaps at various levels, to strengthen understanding, and provide a foundation in detail from which natural curiosity and the capacity for investigation may evolve and develop. It is also anticipated that, in keeping with the spirit of the National Curriculum Framework the syllabus itself will promote project work that encourages the child to take stock of the overlap, to see a problem as existing at different and interconnected levels. Guides to this as well as specific instances will be provided in textbooks.

Throughout, India's own experiences over time, and the solutions advocated by national governments, as well as the problems they have encountered, are expected to give the child a firm sense of locality, region and nation in an interconnected and complex manner. Both the intentions that have stimulated policy, the ideals and compulsions that have guided them as well as the diversity of experience of what has taken place finds attention and enquiry in the syllabus. Equally, comparisons between India's experience and global experiences are encouraged and India's interactions with the world find attention. Social, cultural and political issues are the focus of comparison.

It is within such a framework that the deeper engagement with disciplines are expected to evolve in Classes XI and XII – allowing the young person either to prepare for higher education or a broad range of professions that require more specific skills. While anticipating some of the concerns of higher education, the syllabus of this time must and does focus on foundation rather than information – stimulating an awareness of essential categories, and a broad sense of disciplinary areas.

## HISTORY: OUR PASTS

### *Rationale*

From Class VI all students would read history as a component of Social Sciences. This component has been devised in a way that would help students develop a historical sensibility and awareness of the significance of history. The assumption has been that students need to see history not simply as a set of facts about the past – economic, social, political, and cultural – but that they have to learn to think historically. Students have to acquire a capacity to make interconnections between processes and events, between developments in one place and another, and see the link between histories of different groups and societies. In these three years (VI – VIII) the focus would be primarily on Indian History, from the earliest times to the present. Each year one chronological span of time would be studied. The effort would be to understand some of the social, economic, political and cultural processes within them.

### *Objectives*

- Provide a general idea of the developments within these periods of history. This can be achieved by presenting a broad overview of a theme and a detailed case study. Care will be taken to avoid an excess of detail which can burden textbooks.
- Give an idea of the way historians come to know about the past. Students would be introduced to different types of sources and encouraged to reflect on them critically. This would require that extracts from sources – inscriptions, religious texts, travel accounts, chronicles, newspapers, state documents, visual material etc. – become an integral part of textbooks. Discussions built around these sources would allow learners to develop analytical skills.
- Create a sense of historical diversity. Each theme would provide a broad overview, but would also focus on a case study of one region or a particular event. In choosing the case studies the focus would shift from one region to another, so that the diversity of historical experiences can be studied without over burdening the syllabus.
- Introduce the child to time lines and historical maps that would situate the case studies being discussed, and locate the developments of one region in relation to what was happening elsewhere.

- 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**

<b>Themes</b>	<b>Objectives</b>
<b>An Introduction to History</b>  <b>When, Where and How</b> <ul style="list-style-type: none"> <li>(a) The time frame under study.</li> <li>(b) The geographical framework.</li> <li>(c) Sources.</li> </ul> <b>The Earliest Societies</b> <ul style="list-style-type: none"> <li>(a) Hunting and gathering as a way of life, its implications.</li> <li>(b) Introduction to stone tools and their use.</li> <li>(c) Case study: the Deccan.</li> </ul> <b>The First Farmers and Herders</b> <ul style="list-style-type: none"> <li>(a) Implications of farming and herding.</li> <li>(b) Archaeological evidence for crops, animals, houses, tools, pottery, burials, etc.</li> <li>(c) Case study: the North-West, and North-East.</li> </ul> <b>The First Cities</b> <ul style="list-style-type: none"> <li>(a) The settlement pattern of the Harappan civilisation.</li> <li>(b) Unique architectural features.</li> </ul>	<p>Explain the specific nature of the discipline.</p> <ul style="list-style-type: none"> <li>(a) Familiarise the learner with the major developments to be studied.</li> <li>(b) Develop an understanding of the significance of geographical terms used during the time frame.</li> <li>(c) Illustrate the sources used to reconstruct history.</li> </ul> <ul style="list-style-type: none"> <li>(a) Appreciate the skills and knowledge of hunter gatherers.</li> <li>(b) Identify stone artefacts as archaeological evidence, making deductions from them.</li> </ul> <ul style="list-style-type: none"> <li>(a) Appreciate the diversity of early domestication.</li> <li>(b) Identify the material culture generated by people in relatively stable settlements.</li> <li>(c) Understand strategies for analyzing these.</li> </ul> <ul style="list-style-type: none"> <li>(a) Appreciate the distinctive life in cities.</li> <li>(b) Identify the archaeological evidence of urban centres.</li> </ul>



Themes	Objectives
<p>(c) Craft production. (d) The meaning of urbanism. (e) Case study: the North-West.</p> <p><b>Different Ways of Life</b></p> <p>(a) The Vedas and what they tell us. (b) A contemporary chalcolithic settlement. (c) Case studies: the North-West and the Deccan.</p> <p><b>Early States</b></p> <p>(a) Janapadas to Mahajanapadas (b) Case study: Bihar, Magadha and the Vajji confederacy.</p> <p><b>New Ideas</b></p> <p>(a) Upanisads. (b) Jainism. (c) Buddhism.</p> <p><b>The First Empire</b></p> <p>(a) The expansion of the empire. (b) Asoka (c) Administration.</p> <p><b>Life in towns and villages</b></p> <p>(a) The second urbanisation. (b) Agricultural intensification. (c) Case study: Tamil Nadu.</p>	<p>(c) Understand how this is used to reconstruct processes such as craft production.</p> <p>(a) Appreciate that different developments were taking place in different parts of the subcontinent simultaneously. (b) Introduce simple strategies of textual analysis. (c) Reinforce the skills of archaeological analysis already developed.</p> <p>(a) Introduce the concept of the state and its varieties. (b) Understand the use of textual sources in this context.</p> <p>(a) Outline the basic tenets of these systems of thought, and the context in which they developed and flourished. (b) Introduce excerpts from sources relating to these traditions.</p> <p>(a) Introduce the concept of empire. (b) Show how inscriptions are used as sources.</p> <p>(a) Demonstrate the variety of early urban centres— coastal towns, capitals, religious centres.</p>

Themes	Objectives
<p><b>Contacts with Distant lands</b></p> <p>(a) The Sangam texts and long distance exchange. Suggested regions: the Tamil region, extending to south east Asia and the west.</p> <p>(b) Conquerors from distant lands: north western and western India.</p> <p>(c) The spread of Buddhism: north India to Central Asia.</p> <p><b>Political Developments</b></p> <p>(a) Gupta empire and Harshavardhana.</p> <p>(b) Pallavas and Chalukyas.</p> <p><b>Culture and Science</b></p> <p>(a) Literature, including the Puranas, the epics, other Sanskrit and Tamil works.</p> <p>(b) Architecture including early monasteries and temples, sculpture, painting (Ajanta);</p> <p>(c) Science.</p>	<p>(b) Illustrate the use of archaeological material including coins, sculpture, as well as textual sources to reconstruct social and economic histories.</p> <p>(a) Introduce the idea of different contexts of contact between distant lands, and the motivating forces (including conquest).</p> <p>(b) Examine the implications of journeys within the subcontinent.</p> <p>(c) Illustrate the use of textual and visual material for reconstructing the histories of such contacts.</p> <p>(a) Introduce the idea that strategies of expansion, and their logic, differ.</p> <p>(b) Explain the development of different administrative systems.</p> <p>(c) Understand how <i>prasastis</i> and <i>caritas</i> are used to reconstruct political history.</p> <p>(a) Develop a sense of appreciation of textual and visual traditions of the period.</p> <p>(d) Introduce excerpts from texts and visual material for analysis and appreciation.</p>

## CLASS VII: OUR PASTS – II

Themes	Objectives
<b>Where, When and How</b> <ul style="list-style-type: none"> <li>(a) Terms used to describe the subcontinent and its regions with a map.</li> <li>(b) An outlining of the time frame and major developments.</li> <li>(c) A brief discussion on sources.</li> </ul>	<ul style="list-style-type: none"> <li>(a) Familiarise the student with the changing names of the land.</li> <li>(b) Discuss broad historical trends.</li> <li>(c) Give examples of the kinds of sources that historians use for studying this period. E.g., buildings, chronicles, paintings, coins, inscriptions, documents, music, literature.</li> </ul>
<b>New Kings and Kingdoms</b> <ul style="list-style-type: none"> <li>(a) An outline of political developments c. 700-1200</li> <li>(b) A case study of the Cholas, including agrarian expansion in the Tamil region.</li> </ul>	<ul style="list-style-type: none"> <li>(a) Trace the patterns of political developments and military conquests – Gurjara Pratiharas, Rashtrakutas, Palas, Chahamanas, Ghaznavids.</li> <li>(b) Develop an understanding of the connections between political and economic processes through the exploration of one specific example.</li> <li>(c) Illustrate how inscriptions are used to reconstruct history.</li> </ul>
<b>The Sultans of Delhi</b> <ul style="list-style-type: none"> <li>(a) An overview.</li> <li>(b) The significance of the court, nobility and land control.</li> <li>(c) A case study of the Tughlaqs.</li> </ul>	<ul style="list-style-type: none"> <li>(a) Outline the development of political institutions, and relationships amongst rulers.</li> <li>(b) Understand strategies of military control and resource mobilisation.</li> <li>(c) Illustrate how travellers' accounts, court chronicles and historic buildings are used to write history.</li> </ul>

Themes	Objectives
<b>The Creation of An Empire</b> <ul style="list-style-type: none"> <li>(a) An outline of the growth of the Mughal Empire.</li> <li>(b) Relations with other rulers, administration, and the court.</li> <li>(c) Agrarian relations.</li> <li>(d) A case study of Akbar.</li> </ul>	<ul style="list-style-type: none"> <li>(a) Trace the political history of the 16th and 17<sup>th</sup> centuries.</li> <li>(b) Understand the impact of an imperial administration at the local and regional levels.</li> <li>(c) Illustrate how the <i>Akbarnama</i> and the <i>Ain-i-Akbari</i> are used to reconstruct history.</li> </ul>
<b>Architecture as Power: Forts and Sacred Places</b> <ul style="list-style-type: none"> <li>(a) Varieties of monumental architecture in different parts of the country.</li> <li>(b) A case study of Shah Jahan's patronage of architecture.</li> </ul>	<ul style="list-style-type: none"> <li>(a) Convey a sense of the range of materials, skills and styles used to build: waterworks, places of worship, palaces and havelis, forts, gardens.</li> <li>(b) Understand the engineering and construction skills, artisanal organisation and resources required for building works.</li> <li>(c) Illustrate how contemporary documents, inscriptions, and the actual buildings can be used to reconstruct history.</li> </ul>
<b>Towns, Traders and Craftsmen</b> <ul style="list-style-type: none"> <li>(a) Varieties of urban centres—court towns, pilgrimage centres, ports and trading towns.</li> <li>(b) Case studies: Hampi, Masulipatam, Surat.</li> </ul>	<ul style="list-style-type: none"> <li>(a) Trace the origins and histories of towns, many of which survive today.</li> <li>(b) Demonstrate the differences between founded towns and those that grow as a result of trade.</li> <li>(c) Illustrate how travellers' accounts, contemporary maps and official documents are used to reconstruct history.</li> </ul>

Themes	Objectives
<b>Social Change: Mobile and settled communities</b> (a) A discussion on tribes, nomads and itinerant groups. (b) Changes in the caste structure. (c) Case studies of state formation: Gonds, Ahoms.	(a) Convey an idea of long-term social change and movements of people in the subcontinent. (b) Understand political developments in specific regions. (c) Illustrate how anthropological studies, inscriptions and chronicles are used to write history.
<b>Popular Beliefs and Religious Debates</b> (a) An overview of belief-systems, rituals, pilgrimages, and syncretic cults. (b) Case Study: Kabir.	(a) Indicate the major religious ideas and practices that began during this period. (b) Understand how Kabir challenged formal religions. (c) Illustrate how traditions preserved in texts and oral traditions are used to reconstruct history.
<b>The Flowering of Regional Cultures</b> (a) An overview of the regional languages, literatures, painting, music. (b) Case study: Bengal.	(a) Provide a sense of the development of regional cultural forms, including 'classical' forms of dance and music. (b) (c) Illustrate how texts in a regional language can be used to reconstruct history.
<b>New Political Formations in the Eighteenth Century</b> (a) An overview of the independent and autonomous states in the subcontinent. (a) (b) Case study: Marathas	(a) Delineate developments related to the Sikhs, Rajputs, Marathas, later Mughals, Nawabs of Awadh and Bengal, and Nizam of Hyderabad.

Themes	Objectives
	<p>(b) Understand how the Marathas expanded their area of control.</p> <p>(d) Illustrate how travellers' accounts and state archives can be used to reconstruct history.</p>

### CLASS VII: OUR PASTS – III

Themes	Objectives
<p><b>Where, When, How</b></p> <p>(a) An overview of the period.</p> <p>(b) Introduction to the new geographical categories.</p> <p>(c) An outline of the time frame.</p> <p>(d) An introduction to the sources.</p> <p><b>The Establishment of Company Power</b></p> <p>(a) Mercantilism and trade-wars.</p> <p>(b) Struggle for territory, wars with Indian rulers.</p> <p>(c) The growth of colonial army and civilian administration. <i>Regional focus: Tamil Nadu.</i></p> <p><b>Rural Life and Society</b></p> <p>(a) Colonial agrarian policies; their effect on peasants and landlords.</p> <p>(b) Growth of commercial crops.</p> <p>(c) Peasant revolts: focus on indigo rebellions.</p> <p><i>Regional focus: Bengal and Bihar. Some comparison with later developments in Punjab.</i></p>	<p>(a) Introduce the changing nomenclature of the subcontinent and regions.</p> <p>(b) Delineate major developments within the time frame.</p> <p>(c) Suggest how the sources of study for this period are different to those of earlier periods.</p> <p>(a) Unravel the story of a trading company becoming a political power.</p> <p>(b) Show how the consolidation of British power was linked to the formation of colonial armies and administrative structures.</p> <p>(a) Provide a broad view of changes within rural society through a focus on two contrasting regions.</p> <p>(b) Show the continuities and changes with earlier societies.</p> <p>(c) Discuss how growth of new crops often disrupted the rhythms of peasant life and led to revolts.</p>

Themes	Objectives
<b>Colonialism and Tribal Societies</b> (a) Changes within tribal economies and societies in the nineteenth century. (b) Tribal revolts: focus on Birsa Munda. <i>Regional focus: Chotanagpur and North-East.</i>	(a) Discuss different forms of tribal societies. (b) Show how government records can be read against the grain to reconstruct histories of tribal revolts.
<b>Crafts and Industries</b> (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) Familiarise students with the processes of de-industrialisation and industrialisation. (b) Give an idea of the technologies of weaving and the lives of weavers.
<b>The Revolt of 1857-58</b> (a) The rebellion in the army and the spread of the movement. (b) The nature of elite and peasant participation. <i>Regional focus: Awadh.</i>	(a) Discuss how revolts originate and spread. (b) Point to the changes in colonial rule after 1857. (c) Illustrate how vernacular and British accounts can be read to understand the rebellion.
<b>Education and British rule</b> (a) The new education system – schools, syllabi, colleges, universities, technical training. (b) Changes in the indigenous systems. (c) Growth of 'National education'. <i>Case-studies: Baroda, Aligarh.</i>	(a) Show how the educational system that is seen as universal and normal today has a history. (b) Discuss how the politics of education is linked to questions of power and cultural identity.
<b>Women and reform</b> (a) Debates around <i>sati</i> , widow remarriage, child marriage and age of consent. (b) Ideas of different reformers on the position of women and women's	(a) Discuss why so many reformers focused on the women's question, and how they visualised a change in women's conditions. (b) Outline the history of new laws that

Themes	Objectives
<p>education. <i>Regional focus: Maharashtra and Bengal.</i></p> <p><b>Challenging the Caste System</b></p> <ul style="list-style-type: none"> <li>(a) Arguments for caste reform. The ideas of Phule, Veerasalingam, Sri Narayana Guru, Periyar, Gandhi, Ambedkar.</li> <li>(b) Consequences and implications of the activities of the reformers.</li> </ul> <p><i>Region: Maharashtra, Andhra.</i></p> <p><b>Colonialism and Urban Change</b></p> <ul style="list-style-type: none"> <li>(a) De-urbanisation and emergence of new towns.</li> <li>(b) Implications of colonial policies and institutions – municipalities, public works, planning, railway links, police.</li> </ul> <p><i>Case-study: Delhi.</i></p> <p><b>Changes in the Arts: Painting, Literature, architecture</b></p> <ul style="list-style-type: none"> <li>(a) Impact of new technologies and institutions: art schools, printing press.</li> <li>(b) Western academic style and nationalist art.</li> <li>(c) Changes in performing arts – music and dance enter the public arena.</li> <li>(d) New forms of writing.</li> <li>(e) New architecture.</li> </ul> <p><i>Case-studies: Mumbai, Chennai.</i></p>	<p>affect women's lives.</p> <ul style="list-style-type: none"> <li>(c) Illustrate how autobiographies, biographies and other literature can be used to reconstruct the histories of women.</li> </ul> <ul style="list-style-type: none"> <li>(a) Familiarise students with the biographies and writings of individuals who sought to criticise and reform the caste system.</li> <li>(b) Discuss why the question of caste was central to most projects of social reform.</li> </ul> <ul style="list-style-type: none"> <li>(a) Outline the nature of urban development in the 19th and 20th centuries.</li> <li>(b) Introduce students to the history of urban spaces through photographs.</li> <li>(c) Show how new forms of towns emerged in the colonial period.</li> </ul> <ul style="list-style-type: none"> <li>(a) Outline the major development in the sphere of arts.</li> <li>(b) Discuss how these changes are linked to the emergence of a new public culture.</li> <li>(c) Illustrate how paintings and photographs can be used to understand the cultural history of a period.</li> </ul>



Themes	Objectives
<p><b>The Nationalist Movement</b></p> <ul style="list-style-type: none"> <li>(a) Overview of the nationalist movement from the 1870s to the 1940s.</li> <li>(b) Diverse trends within the movement and different social groups involved.</li> <li>(c) Links with constitutional changes.</li> </ul> <p><i>Case study: Khilafat to Non Cooperation.</i></p> <p><b>India after Independence</b></p> <ul style="list-style-type: none"> <li>(a) National and regional developments since 1947.</li> <li>(b) Relations with other countries.</li> <li>(c) Looking to the future.</li> </ul>	<ul style="list-style-type: none"> <li>(a) Outline the major developments within the national movement and focuses on a detailed study of one major event.</li> <li>(b) Show how contemporary writings and documents can be used to reconstruct the histories of political movements.</li> </ul> <ul style="list-style-type: none"> <li>(a) Discuss the successes and failures of the Indian democracy in the last fifty years.</li> <li>(b) Illustrate how newspapers and recent writings can be used to understand contemporary history.</li> </ul>

## **GEOGRAPHY**

### ***Rationale***

Geography is an integral component of social science. At this stage learners are introduced to the basic concepts necessary for understanding the world in which they live. Geography will be introduced to promote the understanding of interdependence of various regions and countries. The child will be introduced to the contemporary issues such as global distribution of economic resources, gender, marginalized group, and environment and ongoing process of globalisation.

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.
2. initiate the learner into a study of her/his own region, state and country in the global context.
3. introduce the global distribution of economic resources and the ongoing process of globalisation.
4. promote the understanding of interdependence of various regions and countries.

## **CLASS VI: THE EARTH – OUR HABITAT**

<b>Themes</b>	<b>Objectives</b>
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; <b>(Periods-8)</b>
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; <b>(Periods-12)</b>

Themes	Objectives
Maps: essential components of maps distance, directions and symbols.	To develop basic skills of map reading; (Periods-10)
Four realms of the earth: lithosphere, hydrosphere, atmosphere and biosphere: continents and oceans.	To understand interrelationship of the realms of the earth; (Periods-12)
Major relief features of the earth.	To understand major landforms of the earth; (Periods-10)
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. (Periods-13)
<b>Project/Activity</b> <ul style="list-style-type: none"> <li>• Make a chart showing distance of the planets from the sun.</li> <li>• Draw a sketch of your school and locate the following: <ul style="list-style-type: none"> <li>(i) the principal's room</li> <li>(ii) your classroom</li> <li>(iii) playground</li> <li>(iv) library</li> </ul> </li> <li>• Show the major wildlife sanctuaries of your region on a political map of India.</li> <li>• Arrange for a trip to a wildlife sanctuary or zoo.</li> </ul> <p><b>Note:</b> Any similar activities may be taken up.</p>	

## CLASS VII: 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; <b>(Periods-6)</b>
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)	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; <b>(Periods-12)</b>
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)	To understand about atmosphere and its elements; <b>(Periods-10)</b>
Water – fresh and saline, distribution of major water bodies, ocean waters and their circulation. (One case study related with tsunami to be introduced)	To know about distribution of water on the earth; <b>(Periods-10)</b>
Natural vegetation and wild life.	To find out the nature of diverse flora and fauna. <b>(Periods-5)</b>
Human Environment: settlement, transport and communication.	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; <b>(Periods-7)</b>

Themes	Objectives
Human – Environment Interaction: Case Studies – life in desert regions – Sahara and Ladakh; life in tropical and sub-tropical regions – Amazon and Ganga-Brahmaputra; life in temperate regions – Prairies and Veldt.	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. <b>(Periods-15)</b>
<b>Project/Activity</b> <ul style="list-style-type: none"> <li>Collect stories/find out about changes that took place in their areas (identify how things/ surroundings change overnight and why).</li> <li>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.</li> <li>Write observations about local area house types, settlements, transport, communication and vegetation.</li> </ul> <p><b>Note:</b> Any similar activities may be taken up.</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; <b>(Periods-10)</b>
Natural resources: their distribution, utilisation 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; <b>(Periods-14)</b>

Themes	Objectives
<p>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.</p> <p>Industries: classification of industries based on size, raw material, ownership; major industries and distribution; infrastructure and development.</p> <p>Iron and Steel (a comparative study of Jamshedpur and a centre in USA e.g., Detroit).</p> <p>Textile Industry (Ahmedabad and Osaka).</p> <p>Information Technology (Bangalore and Silicon Valley).</p> <p>Human Resources – composition, population change, distribution and density.</p>	<p>Learn about various types of farming and agricultural development in two different regions. <b>(Periods-15)</b></p> <p>To understand important forms of manufacturing industries. <b>(Periods-14)</b></p> <p>To understand the role of human resources in development of nation's economy. <b>(Periods-12)</b></p>
<p><b>Project/Activity</b></p> <ul style="list-style-type: none"> <li>Observe and report about local agricultural practices, crops grown/ manufacturing industries.</li> <li>Collect information regarding some endangered plants and animal species of India.</li> <li>Visit to an industry/local agricultural farm.</li> <li>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.</li> </ul> <p><b>Note:</b> Any similar activities may be taken up.</p>	

## **SOCIAL AND POLITICAL LIFE**

### ***Rationale***

At the elementary stage, the idea is to introduce students to various aspects of political, social and economic life. This will be done through a preliminary focus on certain key concepts, knowledge of which is essential to understand the functioning of Indian democracy. These concepts will be explained using imaginary narratives that allow children to draw connections between these and their everyday experiences. There will be no attempt made at this level to cover all aspects of India's democratic structure, but rather the effort is more to provide an overview with which the child learns to critically engage by constructing herself as an interested citizen of a vibrant and ongoing democratic process. The focus on the real-life functioning of institutions and ideals is to enable the child to grasp the deep interconnectedness between the political and social aspects of her everyday life, as well as the impact of these two in the realm of economic decision-making.

### **Objectives**

- To enable students to make connections between their everyday lives and the issues discussed in the textbook;
- To have students imbibe the ideals of the Indian Constitution;
- To have children gain a real sense of the workings of Indian democracy: its institutions and processes;
- To enable students to grasp the interconnectedness between political, social and economic issues;
- To have them recognise the gendered nature of all of the issues raised;
- To have them develop skills to critically analyse and interpret political, social and economic developments from the point of view of the marginalised;
- To have them recognise the ways in which politics affects their daily lives.

## **CLASS VI**

### **DIVERSITY AND INTERDEPENDENCE**

#### ***Rationale***

In the first year of the new subject area, 'Social and Political Life' the themes of diversity, interdependence and conflict are to be focused on. This is done through first elucidating aspects of social diversity through a discussion of linguistic diversity as well as the

diversity of art forms. In discussing these topics the idea is to celebrate diversity and interdependence while also highlighting that this can be zone for conflict. 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, *Syllabus* 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. The last chapter through its focus on how people make a living in the rural and urban context discusses issues of the diversity of livelihoods.

### Objectives

The specific objectives of the course, where it is not clear from the rationale of the approach, are indicated beside the themes to be taught in the course.

Themes	Objectives
<p><b>UNIT 1: Diversity</b></p> <p>In this unit we focus on various aspects of diversity. The first section begins by having the child recognize diversity as a fact of being human and understanding diversity as different ways of doing the same thing. The second section builds on this by having the child interrogate societal prejudices against diversity, recognising that the self can be made up of multiple identities and that the Constitution compels us to respect diversity.</p> <p><b>Section 1</b></p> <ul style="list-style-type: none"> <li>• Diversity as a fact of being human.</li> <li>• What diversity adds to our lives.</li> <li>• Diversity in India.</li> </ul> <p><b>Section 2</b></p> <ul style="list-style-type: none"> <li>• Prejudice and discrimination.</li> <li>• Inequality and discrimination.</li> <li>• Recognition of multiple identities in oneself.</li> <li>• The Constitution and respect for diversity.</li> </ul>	<p>To enable students to:</p> <ul style="list-style-type: none"> <li>• understand and appreciate various forms of diversity in their everyday environments,</li> <li>• develop a sensitivity towards pluralism and interdependence,</li> <li>• understand how prejudice can lead to discrimination,</li> <li>• understand the difference between diversity and inequality,</li> <li>• recognise that there are multiple identities within ourselves that we use in different contexts and that these can come into conflict with each other, • understand that the Constitution compels us to respect diversity.</li> </ul>



Themes	Objectives
<p><b>UNIT 2: Government</b></p> <p>This unit introduces the student to the idea of government. The first section focuses on the need for it, the history of adult franchise, the various types of governments that exist at present. The second section discusses the key elements that influence the functioning of democratic government.</p> <p><b>Section 1</b></p> <ul style="list-style-type: none"> <li>• The need for government.</li> <li>• Decision-making and participation.</li> <li>• The quest for universal adult franchise through examples of the sufferage movement and the antiapartheid struggle.</li> <li>• Various forms of government and absence of collective sanction.</li> </ul> <p><b>Section 2</b></p> <p>Key elements that influence the functioning of democratic government:</p> <ul style="list-style-type: none"> <li>• Participation and accountability.</li> <li>• Resolution of Conflict.</li> <li>• Concerns for Equality and Justice.</li> </ul> <p><b>UNIT 3: Local Government</b></p> <p>This unit familiarises the student with both rural and urban local government. It covers the <i>Panchayati Raj</i>, rural administration and urban government and administration. The effort is to have the child draw contrasts and comparisons between the ways in which urban and rural local government function.</p> <p><b>Section 1</b></p> <p><b>Panchayati Raj</b></p> <ul style="list-style-type: none"> <li>• Description of panchayat including electoral process, decision making,</li> </ul>	<p>To enable students to:</p> <ul style="list-style-type: none"> <li>• gain a sense of why government is required,</li> <li>• recognise the need for universal adult franchise,</li> <li>• appreciate need to make decisions with collective sanction,</li> <li>• understand key elements that influence the functioning of democracy.</li> </ul> <p>To enable children to</p> <ul style="list-style-type: none"> <li>• understand local level of government functioning,</li> <li>• understand the workings of the panchayati raj and appreciate its importance,</li> <li>• gain a sense of who performs what role within the local administration,</li> <li>• understand how the various levels of administration at the local level are interconnected,</li> </ul>

Themes	Objectives
<p>implementation of decisions</p> <ul style="list-style-type: none"> <li>• Role of a gram sabha</li> <li>• Women and the panchayat</li> </ul> <p><b>Section 2</b></p> <p><b>Urban Local Government</b></p> <ul style="list-style-type: none"> <li>• Municipal corporation elections, decision making structures</li> <li>• The provision of water and the work of the municipal corporation</li> <li>• Citizens protests to get their grievances addressed</li> </ul> <p><b>Section 3</b></p> <p><b>Rural Administration</b></p> <ul style="list-style-type: none"> <li>• Focus on a land dispute and show the role of local police and <i>patwari</i>.</li> <li>• On land records and role of <i>patwari</i>.</li> <li>• On the new inheritance law.</li> </ul> <p><b>UNIT 4: Making a Living</b></p> <p>This unit focuses on individuals earn a livelihood both in the rural and the urban context. The rural context focuses on various types of farmers and the urban one on various types of occupations people engage in to earn an income. The student should be able to compare and contrast the urban and the rural context.</p> <p><b>Section 1</b></p> <p><b>Rural Livelihoods</b></p> <ul style="list-style-type: none"> <li>• Various types of livelihoods prevalent in a village.</li> <li>• Different types of farmers: middle farmer, landless labourers and large farmers.</li> </ul>	<ul style="list-style-type: none"> <li>• understand the intricacies involved in the local administration's provision of water.</li> </ul> <p>To enable students to:</p> <ul style="list-style-type: none"> <li>• understand conditions that underline and impact life strategies of various groups of people,</li> <li>• understand that these conditions and opportunities for making a living are not equally available to all.</li> </ul>

Themes	Objectives
<p><b>Section 2</b></p> <p><b>Urban Livelihoods</b></p> <ul style="list-style-type: none"> <li>• Difference between primary, secondary and tertiary occupations.</li> <li>• Descriptions of various types of livelihoods including vegetable vendor, domestic servant, garment worker and bank employee.</li> <li>• Differences between self-employed, regular employment and wage employment.</li> <li>• The interlinkage between rural and urban lives through a discussion of migration.</li> </ul>	

## CLASS VII

### DEMOCRACY AND EQUALITY

#### *Rationale*

Democracy and Equality are the key ideas to be engaged with this year. The effort is to introduce the learner to certain core concepts, such as equality, dignity, rule of law etc that influence Democracy as a political system. The role of the Constitution as a document that provides the guiding framework to function in a democratic manner is emphasised. This section deals with making the link between democracy and how it manifests itself in institutional systems in a concrete and live manner through case studies and real experiences. The objective is not to represent democracy as a fixed idea or system, but one that is changing and evolving. The learner is introduced to a wide range of institutions- the government, the bureaucracy and civil society organizations like the Media so that she can develop a broad understanding of the relationship between the State and Citizens.

Equality as a value is explored in some detail, where its relationship with democracy is highlighted and the challenges or questions it raises on inequities and hierarchies that exist at present in society is also discussed. An analysis of everyday

experiences in the domain of gender enable the learner to understand how these are related to the creation of differences that are discriminatory in nature.

## Objectives

The specific objectives of the course, where it is not clear from the rationale of the approach, are indicated beside the themes to be taught in the course.

Themes	Objectives
<p><b>UNIT 1: Democracy</b></p> <p>This unit will focus on the historical as well as the key elements that structure a democracy. The structures in place to make people's representation a reality will be discussed with reference to its actual functioning.</p> <p><b>Section 1</b></p> <p>Why Democracy</p> <p>Two main thrusts</p> <ul style="list-style-type: none"> <li>• <b>Historical</b></li> </ul> <p>What were some of the key junctures and transformations in the emergence of democracy in modern societies?</p> <ul style="list-style-type: none"> <li>• <b>Key Features</b> <ul style="list-style-type: none"> <li>– The different systems of power that exist in the world today.</li> <li>– Significant Elements that continue to make Democracy popular in the contemporary world:</li> </ul> </li> <li>• Formal Equality.</li> <li>• Decision Making mechanisms.</li> <li>• Accommodation of differences.</li> <li>• Enhancing human dignity.</li> </ul> <p><b>Section 2</b></p> <p><b>Institutional Representation of Democracy</b></p> <ul style="list-style-type: none"> <li>• Universal Adult Franchise.</li> <li>• Elections.</li> <li>• Political parties.</li> <li>• Coalition Governments.</li> </ul>	<p>To enable students to:</p> <ul style="list-style-type: none"> <li>• develop an understanding of the rule of Law and our involvement with the law,</li> <li>• understand the Constitution as the primary source of all laws,</li> <li>• develop the ability to distinguish between different systems of power,</li> <li>• understand the importance of the idea of equality and dignity in democracy,</li> <li>• develop links between the values/ideas of democracy and the institutional forms and processes associated with it,</li> <li>• understand democracy as representative government,</li> <li>• understand the vision and the values of the Constitution.</li> </ul>

Themes	Objectives
<p><b>UNIT 2: State Government</b></p> <p>This unit will focus on the legislative, executive and administrative aspects of state government. It will discuss processes involved in choosing MLAs, passing a bill and discuss how state governments function through taking up one issue. This unit might also contain a section on the nation-state.</p> <p><b>Section 1: Its working</b></p> <ul style="list-style-type: none"> <li>Main functionaries-broad outline of the role of the Chief minister and the council of ministers</li> </ul> <p><b>Section 2: Its functioning</b></p> <p>Through one example: land reform/irrigation/education/water/ health discuss</p> <ul style="list-style-type: none"> <li>The nature of the role played by the government – regarding resources and services.</li> <li>Factors involved in distribution of resources/services.</li> <li>Access of localities and communities to resources/services.</li> </ul> <p><b>UNIT 3: Understanding Media</b></p> <p>In this unit the various aspects of the role of a media in a democracy will be highlighted. This unit will also include a discussion on advertising as well as on the right to information bill.</p> <p><b>Section 1: Media and Democracy</b></p> <p>Media's role in providing the following:</p> <ul style="list-style-type: none"> <li>providing information,</li> <li>providing forum for discussion/debate creating public opinion.</li> </ul> <p>Media ethics and accountability. Relationship between Government and</p>	<p>To enable students to:</p> <ul style="list-style-type: none"> <li>gain a sense of the nature of decision-making within State government.</li> <li>understand the domain of power and authority exercised by the state government over people's lives.</li> <li>gain a critical sense of the politics underlying the provision of services or the distribution of resources.</li> </ul> <p>To enable students to:</p> <ul style="list-style-type: none"> <li>understand the role of the media in facilitating interaction between the government and citizens,</li> <li>gain a sense that government is accountable to its citizens,</li> <li>understand the link between information and power,</li> <li>gain a critical sense of the impact of media on people's lives and choices,</li> <li>appreciate the significance of people's</li> </ul>

Themes	Objectives
<p>Information. A case-study of the popular struggle that brought about the enactment of this legislation.</p> <p><b>Section 2: On Advertising</b></p> <ul style="list-style-type: none"> <li>Commercial Advertising and consumerism,</li> <li>Social advertising.</li> </ul> <p><b>UNIT 4: Unpacking Gender</b></p> <p>This unit is to understand the role gender plays in ordering our social and economic lives.</p> <p><b>Section 1: Social Aspects</b></p> <p>Norms, values that determine roles expected from boys and girls in the:</p> <ul style="list-style-type: none"> <li>family,</li> <li>community,</li> <li>schools,</li> <li>public spaces,</li> <li>understanding Inequality: The role of gender in creating unequal and hierarchical relations in society.</li> </ul> <p><b>Section 2: Economic Aspects</b></p> <ul style="list-style-type: none"> <li>gender division of labour within family,</li> <li>value placed on women's work within and outside the home,</li> <li>the invisibilisation of women's labour.</li> </ul> <p><b>UNIT 5: Markets Around Us</b></p> <p>This unit is focussed on discussing various types of markets, how people access these and to examine the workings of an actual market.</p> <p><b>Section 1</b></p> <ul style="list-style-type: none"> <li>On retail markets and our everyday needs</li> <li>On role and impact of wholesale markets how are these linked to the above</li> <li>People's access to markets depends upon</li> </ul>	<p>movements in gaining this right.</p> <p>To enable students to:</p> <ul style="list-style-type: none"> <li>understand that gender is a social construct and not determined by biological difference,</li> <li>learn to interrogate gender constructions in different social and economic contexts,</li> <li>to link everyday practices with the creation of inequality and question it.</li> </ul> <p>To enable students to:</p> <ul style="list-style-type: none"> <li>understand markets and their relation to everyday life,</li> <li>understand markets and their function to link scattered producers and consumers,</li> <li>gain a sense of inequity in market operations.</li> </ul>

Themes	Objectives
<p>many factors such as availability, convenience, credit, quality, price, income cycle etc.</p> <p><b>Section 2</b></p> <p>Examine the role of an observable wholesale market such as grain, fruit, or vegetable to understand the chain of activities, the role of intermediaries and its impact on farmer - producers.</p>	

## CLASS VIII

### RULE OF LAW AND SOCIAL JUSTICE

#### *Rationale*

The theme of law and social justice for Class VIII attempts to connect constitutional values and vision to the reality of contemporary India and to look at the constitution as an inspiring and evolving document. Some provisions of the constitution relating to fundamental rights, parliamentary form of government, role of the judiciary and economic role of government are the topics discussed in this light. The attempt is to move from listing rules and functions to discussing some of the key ideas underlying the working of these institutions. The role of people as desiring and striving for a just society and hence responding and evolving laws and structures that govern us is brought forth.

#### **Objectives**

The specific objectives of the course, where it is not clear from the rationale of the approach, are indicated beside the themes to be taught in the course.

Themes	Objectives
<p><b>UNIT 1: The Constitution</b></p> <p>This unit focuses on the Constitution through first highlighting why there is a need for laws and then showing how the Constitution is the framework that determines the making of laws in this country. Aspects of secularism as well as economic justice are highlighted with respect to the Constitution.</p> <p><b>Section 1</b></p> <p>The Role of the Constitution and the Need for Laws</p> <ul style="list-style-type: none"> <li>• On need for laws discussed through an example like dowry,</li> <li>• Role of Constitution in determining the authority/legitimacy of the law,</li> <li>• Laws and Dissent: Salt Satyagraha and a post-1947 example such as anti-liquor agitation.</li> </ul> <p><b>Section 2</b></p> <ul style="list-style-type: none"> <li>• Vision set forth in the Indian Constitution with a focus on secularism.</li> <li>• On how an ideal of the Constitution translates into a law</li> <li>• On how ideals of secularism got translated into fundamental rights.</li> <li>• On Fundamental rights as human rights.</li> <li>• On Fundamental Duties.</li> <li>• On whether the fact that a law exists to secure certain rights mean that in effect these rights have been realised for all. This will be discussed with examples from current efforts of various marginalised communities to realise their rights.</li> </ul>	<p>To enable students to:</p> <ul style="list-style-type: none"> <li>• develop an understanding of the rule of law and our involvement with the law,</li> <li>• understand the Constitution as the primary source of all our laws,</li> <li>• understand laws as evolving and subject to change.</li> <li>• understand the vision and the values of the Constitution,</li> <li>• develop an appreciation of human rights guaranteed in the Constitution</li> <li>• appreciate our continuous involvement with the constitution as a living document</li> </ul>



Themes	Objectives
<p><b>UNIT 2: Parliamentary Government</b></p> <p>In this unit the functioning of parliamentary government and the roles and responsibilities of the various individuals involved in explained in context. In addition the workings of the central government are explained through the steps involved in passing a new law that arose out of people's struggles.</p> <p><b>Section 1</b></p> <ul style="list-style-type: none"> <li>• Reasons why parliamentary form chosen in India.</li> <li>• Main features of composition of parliament and its role in debating a bill.</li> <li>• Accountability of the government to the parliament.</li> <li>• Role of President, PM and the Council of Ministers.</li> </ul> <p><i>Case Study:</i> Debate between Nehru and Rajendra Prasad on the real powers of the President.</p> <p><b>Section 2</b></p> <p>Understand central government through issue of minimum wages or other struggles keeping following in mind:</p> <ul style="list-style-type: none"> <li>– Translation of felt need into law and the critical features of the legislation.</li> <li>– Implication of law.</li> </ul> <p><b>UNIT 3: The Judiciary</b></p> <p>This unit focuses on understanding the judiciary through tracing a case from the lower to the higher courts. It also examines the difference between civil and criminal cases and the difference between the police and the courts as well as provides information on an</p>	<p>To enable students to:</p> <ul style="list-style-type: none"> <li>• understand why India chose a parliamentary form of govt,</li> <li>• gain a sense\rationale of the essential elements of the parliamentary form of government,</li> <li>• analyse the role of people's agency in placing demands for legislation,</li> <li>• understand the ways in which the government and other groups respond to such issues.</li> </ul> <p>To enable students to:</p> <ul style="list-style-type: none"> <li>• understand the main elements of our judicial structure,</li> <li>• appreciate the need for the processes followed,</li> <li>• understand what an FIR is and how to</li> </ul>

[illegible]

Themes	Objectives
<p><b>Section 2</b></p> <p>Different forms of untouchability that continue to exist</p> <ul style="list-style-type: none"> <li>The law on manual scavenging with reference to existing realities in rural and urban areas.</li> </ul> <p><b>UNIT 5: Economic Presence of the Government</b></p> <p>Introduction of various ways by which government is engaged in developmental activities, especially in infrastructure and social sectors.</p> <p>Explain with an example from this area why we need the government, how is the provision done, how does it impact upon people.</p>	<p>To enable students to:</p> <ul style="list-style-type: none"> <li>think about the role of government in the economic sphere,</li> <li>see some links between people's aspirations\ needs and role of government.</li> </ul>

## SCIENCE

### *Introduction*

The exercise of revising the syllabus for Science – or Science and Technology – has been carried out with “Learning without burden” as a guiding light and the position papers of the National Focus Groups as points of reference. The aim is to make the syllabus an enabling document for the creation of textbooks that are interesting and challenging without being loaded with factual information. Overall, science has to be presented as a live and growing body of knowledge rather than a finished product.

Very often, syllabi – especially those in Science – tend to be at once over specified and underspecified. They are over specified in that they attempt to enumerate items of content knowledge which could easily have been left open, e.g., in listing the families of flowering plants that are to be studied. They are underspecified because the listing of ‘topics’ by keywords such as ‘Reflection’ fails to define the intended breadth and depth of coverage. Thus there is a need to change the way in which a syllabus is presented.

The position paper on the Teaching of Science – supported by a large body of research on Science Education – recommends a pedagogy that is hands-on and inquiry-based. While this is widely accepted at the idea level, practice in India has tended to be dominated by chalk and talk methods. To make in any progress in the desired direction, some changes have to be made at the level of the syllabus. In a hands-on way of learning science, we start with things that are directly related to the child’s experience, and are therefore specific. From this we progress to the general. This means that ‘topics’ have to be reordered to reflect this. An example is the notion of electric current. If we think in an abstract way, current consists of charges in motion, so we may feel it should be treated at a late stage, only when the child is comfortable with ‘charge’. But once we adopt a hands-on approach, we see that children can easily make simple electrical circuits, and study several aspects of ‘current’, while postponing making the connection with ‘charge’.

Some indication of the activities that could go into the development of a ‘topic’ would make the syllabus a useful document. Importantly, there has to be adequate time for carrying out activities, followed by discussion. The learner also needs time to reflect on the classroom experience. This is possible only if the content load is reduced substantially, say by 20-25%.

Children are naturally curious. Given the freedom, they often interact and experiment with things around them for extended periods. These are valuable learning experiences, which are essential for imbibing the spirit of scientific inquiry, but may not always conform to adult expectations. It is important that any programme of study give children the needed space, and not tie them down with constraints of a long list of ‘topics’ waiting to be ‘covered’. Denying them this opportunity may amount to killing their spirit of inquiry. To repeat an oft-quoted saying: “It is better to uncover a little than to cover a lot.” Our ultimate aim is to help children learn to become autonomous learners.

### ***Themes and Format***

There is general agreement that Science content up to Class X should not be framed along disciplinary lines, but rather organised around themes that are potentially cross-disciplinary in nature. In the present revision exercise, it was decided that the same set of themes would be used, right from Class VI to Class X. The themes finally chosen are: Food, Materials, 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.

The themes are largely self-explanatory and close to those adopted in the 2000 syllabus for Classes VI-VIII; nevertheless, some comments may be useful. 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.

The format of the syllabus has been evolved to address the under specification mentioned above. Instead of merely listing ‘topics’, the syllabus is presented in four columns: Questions, Key concepts, Resources and Activities/Processes.

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?”), but the majority are questions posed by the adult to support and facilitate learning (provide ‘scaffolding’, in the language of social constructivism). It should be clarified here that these questions are not meant to be used for evaluation or even directly used in textbooks.

Along with the questions, key concepts are listed. As the name suggests, these are those concepts which are of a key nature. Once we accept that concept development is a complex process, we must necessarily abandon the notion that acquisition of a specific concept will be the outcome of any single classroom transaction, whether it is a lecture or an activity. A number of concepts may get touched upon in the course of transaction. It is not necessary to list all of them.

The columns of Resources and Activities/Processes are meant to be of a suggestive nature, for both teachers and textbook writers. The Resources column lists not only concrete materials that may be needed in the classroom, but a variety of other resources, including out-of-class experiences of children as well as other people. Historical accounts and other narratives are also listed, in keeping with the current understanding that narratives can play an important role in teaching science. The Activities column lists experiments, as normally understood in the context of science, as well as other classroom processes in which children may be actively engaged, including discussion. Of course, when we teach science in a hands-on way, activities are not add-ons; they are integral to the development of the subject. Most experiments/activities would have to be carried by children in groups. Suggestions for field trips and surveys are also listed here. Although the items in this column are suggestive, they are meant to give an idea of the unfolding of the content. Read together with the questions and key concepts, they delineate the breadth and depth of coverage expected.

### *The Upper Primary or Middle Stage*

When children enter this stage, they have just completed their primary schooling. It is important to start with things that are within the direct experience of the child. The need for continuity within thematic areas, and the effect this has on the structure, has already been mentioned above.

This is the stage where children can and should be provided plentiful opportunities to engage with the processes of science: observing things closely, recording observations, tabulation, drawing, plotting graphs – and, of course, drawing inferences from what they observe. Sufficient time and opportunities have to be provided for this.

During this stage we can expect the beginnings of quantitative understanding of the world. However, laws such as the universal law of gravitation, expressed in mathematical form, involve multiple levels of abstraction and have to be postponed to the next stage.

One of the major structural problems that plagues science education at this level is the lack of experimental facilities. Children of these classes usually have no access to any equipment, even if the school has functional laboratories for higher classes. While many experiments can be performed with ‘zero-cost’ equipment, it is unfair to deny children the opportunities of handling, e.g., magnets, lenses and low-cost microscopes. This syllabus is based on the assumption that a low-cost science kit for the middle classes can and will be designed. The Syllabus Revision Committee recommends that governments and other agencies make enough copies of such kits available to schools, assuming that children will perform the experiments themselves, in groups. Until a kit is designed and provided, specific items that are needed should be identified and procured. Glassware, common chemicals, lenses, slides etc. are items that will be in any such list. Such items are referred to as ‘kit items’ in the resources column of the syllabus.

At this stage, many children enter puberty. They are curious about their own bodies and sexuality, while being subject to social restrictions and taboos. Thus it is important that the topic of human reproduction not be treated merely as a biological process. Thus the syllabus provides space for addressing social taboos, and for making counselling on these matters part of the classroom process.

## CLASS VI

Questions	Key Concept	Resources	Activities/ Processes
<b>1. Food</b> <i>Sources of food</i> 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.	(Periods-20)  Germination of seeds such as mung, chick pea etc.; preparing a chart on food habits of animals and food culture of different regions of India.
<i>Components of food</i> 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.
<i>Cleaning food</i> How do we separate the grains after harvesting the wheat /rice crop?	Threshing, winnowing, hand picking, sedimentation, filtration.	Talking to some elders about practices after harvesting the crop; kit materials.	Discussion on threshing, winnowing, handpicking; experiments on sedimentation, filtration. Separating



Questions	Key Concept	Resources	Activities/ Processes
<p><b>2. Materials</b></p> <p><i>Materials of daily use</i></p> <p>What are our clothes made of? How did people manage when there were no clothes?</p> <p>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?</p> <p><i>Different kinds of materials</i></p> <p>What kinds of things do we see around us?</p>	<p>Different types of cloth materials – cotton, wool, silk and synthetics. Development of clothing materials.</p> <p>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.</p> <p>Grouping things on the basis of common properties.</p>	<p>Sharing of prior knowledge with parents and community. Archaeological and historical accounts.</p> <p>Sharing of prior knowledge with parents and community.</p> <p>Materials, kit items.</p>	<p>mixture of salt and sand.</p> <p><b>(Periods-26)</b></p> <p>Whole class discussion Simple activities to distinguish among different types of cloth.</p> <p>Whole class discussion. Field survey/ collecting information on locally available plant fibres (coconut, silk cotton, etc.)</p> <p>Collecting and grouping things on the basis of gross properties e.g. roughness, lustre, transparency, solubility, sinking/floating</p>

Questions	Key Concept	Resources	Activities/ Processes
<p><i>How things change/ react with one another</i></p> <p>In what ways do things change on being heated? Do they change back on being cooled? Why does a burning candle get shorter?</p>	<p>Some changes can be reversed and others cannot be reversed.</p>	<p>Prior knowledge, kit items.</p>	<p>using prior knowledge, through experiments.</p> <p>Experiments involving heating of air, wax, paper, metal, water to highlight effects like burning, expansion/ compression, change of state.</p> <p>Discussion on other changes which cannot be reversed – growing up, opening of a bud, ripening of fruit, curdling of milk.</p>
<p>How much salt can be dissolved in a cup of water?</p>	<p>Solubility, saturated solutions.</p> <p>Amount of substance dissolving varies with temperature.</p> <p>At the same temperature amounts of different substances that dissolve varies.</p>	<p>Salt, sugar and other common substances, kit items.</p>	<p>Experiments for testing the solubility of commonly available substances.</p> <p>Experiments on the effect of heating and cooling on solubility.</p> <p>Comparison of solubilities of different substances using non- standard units (e.g. spoon, paper cone).</p>

Questions	Key Concept	Resources	Activities/ Processes
<p><b>3. The World of the Living</b></p> <p><i>Things around us</i></p> <p>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 the dark?</p> <p><i>The habitat of the living</i></p> <p>How does habitat affect plants and animals? How do fish live in water?</p>	<p>Living/ non-living characteristics; habitat; biotic, abiotic (light, temperature, water, air, soil, fire)</p> <p>Habitat varies – aquatic, deserts, mountains etc. – plants and animals show adaptation; other plant part modifications like tendrils, thorns etc. Animals in deserts and water.</p>	<p>Recollection of diversity of living organisms and the habitat where they live.</p> <p>Potted plants or seeds, pots, etc.; thermometer, any water plants, any xerophytic plants, Information on desert and aquatic plants and animals.</p>	<p>(Periods-36)</p> <p>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.</p> <p>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</p>

Questions	Key Concept	Resources	Activities/ Processes
<p><b><i>Plants – form and function</i></b></p> <p>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?</p>	<p>Morphological structure and function of root, stem and leaves. Structure of the flower, differences.</p>	<p>Plants, flowers, blade, hand lens.</p>	<p>environmental factors (water availability, temperature) affect living organisms;</p> <p>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.</p>
<p><b><i>Animals – form and function</i></b></p> <p>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?</p>	<p>Structure and functions of the animal body; Human skeletal system, some other animals e.g. fish, bird, cockroach, snail.</p>	<p>Observation of nature; model of skeleton, X-rays of arms or legs, chest, hips, jaws, vertebral column (could be given in the textbook).</p>	<p>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.</p>

Questions	Key Concept	Resources	Activities/ Processes
<b>4. Moving Things, People and Ideas</b> <b><i>Moving</i></b> How did people travel from one place to another in earlier times? How did they know how far they had travelled? How do we know that something is moving? How do we know how far it has moved?	Need to measure distance (length). Measurement of length. Motion as change in position with time.	Everyday experience; equipment (scale etc.) to measure length. Stories for developing contexts for measuring distances.	<b>(Periods-12)</b> Measuring lengths and distances. Observation of different types of moving objects on land, in air, water and space. Identification and discrimination of various types of motion. Demonstrating objects having more than one type of movement (screw motion, bicycle wheel, fan, top etc.) Observing the periodic motion in hands of a clock / watch, sun, moon, earth.
<b>5. How things work</b> <b><i>Electric current and circuits</i></b> How does a torch work?	Electric current: Electric circuit (current flows only when a cell and other components are connected in an unbroken loop)	Torch: cell, bulb or led, wires, key.	<b>(Periods-28)</b> Activity using a bulb, cell and key and connecting wire to show flow of current and identify closed and open circuits. Making a switch.

Questions	Key Concept	Resources	Activities/ Processes
Do all materials allow current to flow through them?	Conductor, Insulator.	Mica, paper, rubber, plastic, wood, glass metal clip, water, pencil (graphite), etc.	Opening up a dry cell.  Experiment to show that some objects (conductors) allow current to flow and others (insulators) do not.
<b>Magnets</b> What is a magnet?	Magnet.	Magnet, iron pieces.	Demonstrating how things are attracted by a magnet. Classification of objects into magnetic/ non-magnetic classes.
Where on a magnet do things stick?	Poles of a magnet.	Magnet, iron pieces, iron filings, paper.	Activity to locate poles of a magnet; activity with iron filings and paper.
How is a magnet used to find direction?	A freely suspended magnet always aligns in a particular direction. North and South poles.	Bar magnet, stand, thread, compass.	Activities with suspended bar magnet and with compass needle.
How do two magnets behave when brought close to each other?	Like poles repel and unlike poles attract each other.	Two bar magnets, thread, stand.	Activities to show that like poles repel and unlike poles attract.

Questions	Key Concept	Resources	Activities/ Processes
<p><b>6. Natural Phenomena</b>  <b>Rain, thunder and lightning</b>            Where does rain come from? How do clouds form?</p>	<p>Evaporation and condensation, water in different states.            Water cycle.</p>	<p>Everyday experience; kit items.</p>	<p>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.</p>
<p><b>Light</b>            Which are the things we can see through?</p>	<p>Classification of various materials in terms of transparent, translucent and opaque.</p>	<p>Previous experience, candle/torch/lamp, white paper, cardboard box, black paper.</p>	<p><b>(Periods-26)</b>            Discussion, observation; looking across different materials at a source of light.</p>
<p>When are shadows formed? Do you get a shadow at night – when there is no light in the room, no moonlight or other source of light? What colour is a shadow?</p>	<p>A shadow is formed only when there is a source of light and an opaque material obstructs a source it. A shadow is black irrespective of the colour of the object.</p>	<p>Child's own experience, candle/torch/lamp, white paper, black paper, coloured objects.</p>	<p>Discussion; observing shadow formation of various objects of different shapes, and of same shape and different colours; playing and forming shadows with the hands in sunlight, in candle light, and in a well lit region during daytime; making a</p>

Questions	Key Concept	Resources	Activities/ Processes
<p>On what kinds of surfaces can we see images?</p> <p><b>7. Natural Resources</b></p> <p><b><i>Importance of water</i></b></p> <p>What will happen to soil, people, domestic animals, rivers, ponds and plants and animals if it does not rain this year?</p> <p>What will happen to soil, people, domestic animals, plants and animals living in rivers and ponds, if it rains heavily?</p> <p><b><i>Importance of air</i></b></p> <p>Why do earthworms come out of the soil when it rains?</p>	<p>Reflecting surfaces; images are different from shadows.</p> <p>Importance of water, dependence of the living on water. Droughts and floods.</p> <p>Some animals and plants live in water; some live on land and some live in upper layers of soil; but all need air to breath/to respire.</p>	<p>Experience, objects with polished surfaces, mirror etc.</p> <p>Experience, newspaper reports.</p> <p>Experience.</p>	<p>pinhole camera and observing static and moving objects.</p> <p>Observing differences between the image and the shadow of the same object.</p> <p>Estimation of water used by a family in one day, one month, one year.</p> <p>Difference between need and availability. Discussion.</p> <p>Activity: plant growth in normal, deficient and excess water conditions.</p> <p>Discussion.</p>



Questions	Key Concept	Resources	Activities/ Processes
<p><b>Waste</b></p> <p>Do you throw away fruit and vegetable peels and cuttings? Can these be re-used? If we dump them anywhere, will it harm the surroundings? What if we throw them in plastic bags?</p>	<p>Waste; recycling of waste products; things that rot and things that don't. Rotting is supported by animals/animal and plant products.</p>	<p>Observation and experience</p>	<p>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.</p>

## CLASS VII

Questions	Key Concept	Resources	Activities/ Processes
<p><b>1. Food</b></p> <p><b>Food from where</b></p> <p>How do plants get their food?</p>	<p>Autotrophic and heterotrophic nutrition; parasites, saprophytes; photosynthesis.</p>	<p>Coleus or any other plant with variegated leaves, alcohol, iodine solution, kit materials.</p>	<p>(Periods-22)</p> <p>Need for light, green leaf for photosynthesis, looking at any saprophyte/parasite and noting differences from a green plant.</p>
<p><b>Utilisation of food</b></p> <p>How do plants and animals utilise their food?</p>	<p>Types of nutrition, nutrition in amoeba and human beings, Digestive system –</p>	<p>Model of human teeth, charts of alimentary canal, types of nutrition</p>	<p>Effect of saliva on starch, permanent slide of <i>Amoeba</i>. Role play with</p>

Questions	Key Concept	Resources	Activities/ Processes
<p><b>2. Materials</b></p> <p><i>Materials of daily use</i></p> <p>Do some of our clothes come from animal sources? Which are these animals? Who rears them? Which parts of the animals yield the yarn? How is the yarn extracted?</p> <p>What kinds of clothes help us to keep warm? What is heat? What is the meaning of 'cool'/'cold' and 'warm' 'hot'? How does heat flow from/to our body to/from the surroundings?</p> <p><i>Different kinds of materials</i></p> <p>Why does turmeric stain become red on applying soap?</p>	<p>human, ruminants; types of teeth; link with transport and respiration.</p> <p>Wool, silk – animal fibres. Process of extraction of silk; associated health problems.</p> <p>Heat flow; temperature.</p> <p>Classification of substances into acidic, basic and</p>	<p>etc., chart and model of amoeba. The story of the stomach with a hole.</p> <p>Samples of wool and silk; brief account of silkworm rearing and sheep breeding.</p> <p>Potassium permanganate, metal strip or rod, wax, common pins, spirit lamp, matches, tumblers, Thermometer etc.</p> <p>Common substances like sugar, salt, vinegar etc, test</p>	<p>children.</p> <p><b>(Periods-38)</b></p> <p>Collection of different samples of woollen and silk cloth. Activities to differentiate natural silk and wool from artificial fibres. Discussion.</p> <p>Experiment to show that 'hot' and 'cold' are relative. Experiments to show conduction, convection and radiation.</p> <p>Reading a thermometer.</p> <p>Testing solutions of common substances like sugar, salt,</p>

Questions	Key Concept	Resources	Activities/ Processes
<p><i>How things change/react with one another</i></p> <p>What gets deposited on a tawa/khurpi /kudal if left in a moist state?</p> <p>Why does the exposed surface of a cut brinjal become black?</p>	<p>neutral; indicators.</p> <p>Chemical substances; in a chemical reaction a new substance is formed.</p>	<p>tubes, plastic vials, droppers, etc.</p> <p>Test tubes, droppers, common pins, vinegar, baking powder, CuSO<sub>4</sub>, etc.</p>	<p>vinegar, lime juice etc. with turmeric, litmus, china rose. Activity to show neutralisation.</p> <p>Experiments involving chemical reactions like rusting of iron, neutralization (vinegar and baking soda), displacement of Cu from CuSO<sub>4</sub> etc.</p> <p><i>Introduce chemical formulae without explaining them.</i></p>
<p>Why is seawater salty?</p> <p>Is it possible to separate salt from seawater?</p>	<p>Substances can be separated by crystallisation.</p>	<p>Urea, copper sulphate, alum etc, beaker, spirit lamp, watch glass, plate, petridish etc.</p>	<p>Making crystals of easily available substances like urea, alum, copper sulphate etc. using supersaturated solutions and evaporation.</p>
<p><b>3. The World of the Living</b></p> <p><i>Surroundings affect the living</i></p> <p>Why are nights cooler? How does having winters and</p>	<p>Climate, soil types, soil profile, absorption of water</p>	<p>Data on earth, sun – size, distance etc, daily changes in</p>	<p>(Periods-42)</p> <p>Graph for daily changes in temperature, day</p>

Questions	Key Concept	Resources	Activities/ Processes
<p>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 ground?</p> <p><i>The breath of life</i></p> <p>Why do we/ animals breathe? Do plants also breathe? Do they also respire? How do plants/ animals live in water?</p> <p><i>Movement of substances</i></p> <p>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</p>	<p>in soil, suitability for crops, adaptation of animals to different climates.</p> <p>Respiration in plants and animals.</p> <p>Herbs, shrubs, trees; Transport of food and water in plants; circulatory and excretion system in animals; sweating.</p>	<p>temperature, humidity from the newspaper, sunrise, sunset etc.</p> <p>Lime water, germinating seeds, kit materials.</p> <p>Twig, stain; improvised stethoscope; plastic bags, plants, egg, sugar, salt, starch, Benedicts solution, AgNO<sub>3</sub> solution.</p>	<p>length, humidity etc.; texture of various soils by wetting and rolling; absorption/ percolation of water in different soils, which soil can hold more water.</p> <p>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.</p> <p>Translocation of water in stems, demonstration of transpiration, measurement of pulse rate, heartbeat; after exercise etc. Discussion on dialysis, importance; experiment on</p>

Questions	Key Concept	Resources	Activities/ Processes
<p>all animals have blood? What is there in urine?</p> <p><b><i>Multiplication in plants</i></b></p> <p>Why are some plant parts like potato, onions 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?</p>	<p>Vegetative, asexual and sexual reproduction in plants, pollination - cross, self-pollination; pollinators, fertilisation, fruit, seed.</p>	<p><i>Bryophyllum</i> leaves, potato, onion etc.; yeast powder, sugar.</p>	<p>dialysis using egg membrane.</p> <p>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.</p>
<p><b>4. Moving Things, People and Ideas</b></p> <p><b><i>Moving objects</i></b></p> <p>Why do people feel the need to measure time? How do we know how fast something is moving?</p>	<p>Appreciation of idea of time and need to measure it. Measurement of time using periodic events. Idea of speed of moving objects – slow and fast motion along a straight line.</p>	<p>Daily-life experience; metre scale, wrist watch/ stop watch, string etc.</p>	<p>(Periods-16)</p> <p>Observing and analysing motion (slow or fast) of common objects on land, in air, water and space. Measuring the distance covered by objects moving on a road in a given time and calculating their</p>

Questions	Key Concept	Resources	Activities/ Processes
<p><b>5. How Things Work</b></p> <p><i>Electric current and circuits</i></p> <p>How can we conveniently represent an electric circuit?</p> <p>Why does a bulb get hot?</p> <p>How does a fuse work?</p> <p>How does the current in a wire affect the direction of a compass needle?</p>	<p>Electric circuit symbols for different elements of circuit.</p> <p>Heating effect of current.</p> <p>Principle of fuse.</p> <p>A current-carrying wire has an effect on a magnet.</p>	<p>Recollection of earlier activities. Pencil and paper.</p> <p>Cells, wire, bulb.</p> <p>Cells, wire, bulb or LED, aluminium foil.</p> <p>Wire, compass, battery.</p>	<p>speeds. Plotting distance vs. time graphs for uniform motion. Measuring the time taken by moving objects to cover a given distance and calculating their speeds.</p> <p>Constancy of time period of a pendulum.</p> <p>Drawing circuit diagrams.</p> <p>Activities to show the heating effect of electric current.</p> <p>Making a fuse.</p> <p>Activity to show that a current-carrying wire has an effect on a magnet.</p>

Questions	Key Concept	Resources	Activities/ Processes
What is an electromagnet?	A current-carrying coil behaves like a magnet.	Coil, battery, iron nail.	Making a simple electro- magnet. Identifying situations in daily life where electro- magnets are used.
How does an electric bell work?	Working of an electric bell.	Electric bell.	Demonstration of working of an electric bell.
<b>6. Natural Phenomena</b> <i>Rain, thunder and lightning</i> 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.	(Periods-24)  Making wind speed and wind direction indicators. Activity to show “lift” due to moving air. Discussion on effects of storms and possible safety measures.
<b>Light</b> Can we see a source of light through a bent tube?	Rectilinear propagation of light.	Rubber/plastic tube/ straw, any source of light.	Observation of the source of light through a straight tube, a bent tube.
How can we throw sunlight on a wall?	Reflection, certain surfaces reflect light.	Glass/metal sheet/metal foil, white paper.	Observing reflection of light on wall or white paper screen.

Questions	Key Concept	Resources	Activities/ Processes
What things give images that are magnified or diminished in size?	Real and virtual images.	Convex/concave lenses and mirrors.	Open ended activities allowing children to explore images made by different objects, and recording observations. Focussed discussions on real and virtual images.
How can we make a coloured disc appear white?	White light is composed of many colours.	Newton's disc.	Making the disc and rotating it.
<b>7. Natural Resources</b> <b>Scarcity of water</b> 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.



Questions	Key Concept	Resources	Activities/ Processes
<p><b><i>Forest products</i></b> What are the products we get from forests? Do other animals also benefit from forests? What will happen if forests disappear?</p> <p><b><i>Waste Management</i></b> 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?</p>	<p>Interdependence of plants and animals in forests. Forests contribute to purification of air and water.</p> <p>Sewage; need for drainage/sewer systems that are closed.</p>	<p>Case material on forests.</p> <p>Observation and experience; photographs.</p>	<p>Case study of forests.</p> <p>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 sewage disposal.</p>

## CLASS VIII

Questions	Key Concept	Resources	Activities/ Processes
<b>1. Food</b> <b><i>Crop production</i></b> 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.	(Periods-22)  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.
<b><i>Micro-organisms</i></b> 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.

Questions	Key Concept	Resources	Activities/ Processes
<p><b>2. Materials</b> <i>Materials in daily life</i></p> <p>Are some of our clothes synthetic? How are they made? Where do the raw materials come from? Do we use other materials that are synthetic?</p> <p>Do we use cloth (fabric) for purposes other than making clothes to wear? What kind of fabric do we see around us? What are they used for?</p> <p><i>Different kinds of materials and their reactions.</i></p> <p>Can a wire be drawn out of wood? Do copper or aluminium also rust like iron? What is the black material inside a pencil? Why are electrical</p>	<p>Synthetic clothing materials. Other synthetic materials, especially plastics; usefulness of plastics and problems associated with their excessive use.</p> <p>There are a variety of fibrous materials in use. A material is chosen based on desired property.</p> <p>Metals and non-metals.</p>	<p>Sharing of prior knowledge, source materials on petroleum products.</p> <p>Collection of material from neighbourhood or should be part of the kit.</p> <p>Kit items.</p>	<p>(Periods-26)</p> <p>Survey on use of synthetic materials. Discussion.</p> <p>Testing various materials– for action of water, reaction on heating, effect of flame, electrical conductivity, thermal conductivity, tensile strength.</p> <p>Simple observations relating to physical properties of metals and non-metals, displacement reactions, experiments involving reactions with acids and bases.</p>

Questions	Key Concept	Resources	Activities/ Processes
<p>wires made of aluminium or copper?</p> <p><i>How things change/ react with one another</i></p> <p>What happens to the wax when a candle is burnt? Is it possible to get this wax back?</p> <p>What happens to kerosene/natural gas when it is burnt? Which fuel is the best? Why?</p> <p><b>3. The World of the Living</b></p> <p><i>Why conserve</i></p> <p>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?</p>	<p>Combustion, flame</p> <p>All fuels release heat on burning. Fuels differ in efficiency, cost etc. Natural resources are limited. Burning of fuels leads to harmful by products.</p> <p>Conservation of biodiversity/wild life/ plants; zoos, sanctuaries, forest reserves etc. flora, fauna endangered species, red data book; endemic species, migration.</p>	<p>“The Chemical History of a Candle”, by M. Faraday, 1860.</p> <p>Collecting information from home and other sources.</p> <p>Films on wild life, TV programmes, visit to zoo/forest area/sanctuaries etc.; case study with information on dis- appearing tigers; data on endemic and endangered species from MEF, Govt. of</p>	<p>Introduction of word equations.</p> <p>Experiments with candles.</p> <p>Collecting information. Discussions involving whole class.</p> <p>(Periods-44)</p> <p>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</p>

Questions	Key Concept	Resources	Activities/ Processes
<p><b><i>The cell</i></b> What is the internal structure of a plant – what will we see if we look under the microscope? Which cells from our bodies can be easily seen? Are all cells similar?</p>	Cell structure, plant and animal cells, use of stain to observe, cell organelles – nucleus, vacuole, chloroplast, cell membrane, cell wall.	India, NGOs  Microscope, onion peels, epidermal peels of any leaves, petals etc., buccal cavity cells, <i>Spirogyra</i> ; permanent slides of animal cells.	poaching, economics.  Use of a microscope, preparation of a slide, observation of onion peel and cheek cells, other cells from plants e.g. <i>Hydrilla</i> leaf, permanent slides showing different cells, tissues, blood smear; observation of T.S. stem to see tissues; observing diverse types of cells from plants and animals (some permanent slides).
<p><b><i>How babies are formed</i></b> How do babies develop inside the mother? Why does our body change when we reach our teens? How is the sex of the child determined? Who looks after the babies in your homes? Do all animals give birth to young ones?</p>	Sexual reproduction and endocrine system in animals, secondary sexual characters, reproductive health; internal and external fertilisation.	Counsellors, films, lectures.	Discussion with counsellors on secondary sexual characters, on how sex of the child is determined, safe sex, reproductive health; observation on eggs, young ones, life cycles. Discussion on Gender issues and social taboo's.

Questions	Key Concept	Resources	Activities/ Processes
<p><b>4. Moving things, People and Ideas</b></p> <p><b><i>Idea of force</i></b></p> <p>What happens when we push or pull anything? How can we change the speed, direction of a moving object? How can we shape the shape of an object?</p>	<p>Idea of force-push or pull; change in speed, direction of moving objects and shape of objects by applying force; contact and non-contact forces.</p>	<p>Daily-life experience, kit items.</p>	<p>Observing and analysing the relation between force and motion in a variety of daily-life situations. Demonstrating change in speed of a moving object, its direction of motion and shape by applying force. Measuring the weight of an object, as a force (pull) by the earth using a spring balance.</p>
<p><b><i>Friction</i></b></p> <p>What makes a ball rolling on the ground slow down?</p>	<p>Friction – factors affecting friction, sliding and rolling friction, moving; advantages and disadvantages of friction for the movement of automobiles, airplanes and boats/ships; increasing and reducing friction.</p>	<p>Various rough and smooth surfaces, ball bearings.</p>	<p>Demonstrating friction between rough/smooth surfaces of moving objects in contact, and wear and tear of moving objects by rubbing (eraser on paper, card board, sand paper). Activities on static, sliding and rolling friction. Studying ball bearings.</p>

Questions	Key Concept	Resources	Activities/ Processes
<p><b>Pressure</b></p> <p>Why are needles made pointed? Why does a balloon burst if too much air is blown into it? Why does an inverted glass/ bottle/pitcher resist being pushed down into water? How can air/liquids exert pressure?</p>	Idea of pressure; pressure exerted by air/liquid; atmospheric pressure.	Daily-life experiences; Experimentation- improvised manometer and improvised pressure detector.	<p>Discussion on other methods of reducing friction and ways of increasing friction.</p> <p>Observing the dependence of pressure exerted by a force on surface area of an object.</p> <p>Demonstrating that air exerts pressure in a variety of situations.</p> <p>Demonstrating that liquids exert pressure.</p> <p>Designing an improvised manometer and measuring pressure exerted by liquids.</p> <p>Designing improvised pressure detector and demonstrating increase in pressure exerted by a liquid at greater depths.</p>
<p><b>Sound</b></p> <p>How do we communicate through sound? How is sound produced? What characterises</p>	Various types of sound; sources of sound; vibration as a cause of sound; frequency; medium	Daily-life experiences; kit items; musical instruments.	Demonstrating and distinguishing different types (loud and feeble, pleasant/ musical

Questions	Key Concept	Resources	Activities/ Processes
different sounds?	for propagation of sound; idea of noise as unpleasant and unwanted sound and need to minimise noise.		and unpleasant/noise, audible and inaudible) of sound. Producing different types of sounds. using the same source. Making a 'Jal Tarang'. Demonstrating that vibration is the cause of sound. Designing a toy telephone. Identifying various sources of noise. (unpleasant and unwanted sound) in the locality and thinking of measures to minimise noise and its hazards (noise-pollution).
<b>5. How Things Work</b> <i>Electric current and circuits</i> Why do we get a shock when we touch an electric appliance with wet hands?	Water conducts electricity depending on presence/ absence of salt in it. Other liquids may or may not conduct electricity.	Rubber cap, pins, water, bulb or LED, cells, various liquids.	<b>(Periods-14)</b>  Activity to study whether current flows through various liquid samples (tap water, salt solution, lemon juice, kerosene, distilled water if available).



Questions	Key Concept	Resources	Activities/ Processes
What happens to a conducting solution when electric current flows through it?	Chemical effects of current.	Carbon rods, beaker, water, bulb, battery.	Emission of gases from salt solution. Deposition of Cu from copper sulphate solution. Electric pen using KI and starch solution.
How can we coat an object with a layer of metal?	Basic idea of electroplating.	Improvised electrolytical cell, $\text{CuSO}_4$	Simple experiment to show electroplating.
<b>6. Natural Phenomena</b> <i>Rain, thunder and lightning</i> 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.	(Periods-26)  Discussion on sparks. Experiments with comb and paper to show positive and negative charge. Discussion on lightning conductor.
<i>Light</i> What are the differences between the images formed on a new utensil and an old one? Why is there this difference?	Laws of reflection.	Mirror, source of light, ray source (mirror covered with black paper with a thin slit).	Exploring laws of reflection using ray source and another mirror.
When you see your image in the mirror it appears as if the	Characteristics of image formed with a plane mirror.	Plane glass, candle, scale.	Locating the reflected image using glass sheet and candles.

Questions	Key Concept	Resources	Activities/ Processes
left is on the right—why?			
Why don't we see images on all surfaces around us? What makes things visible?	Regular and diffused reflection. Reflection of light from an object to the eye.	Experience	Discussion with various examples. Activity of observing an object through an object through a straight and bent tube; and discussion.
How do we see images of our back in a mirror?	Multiple reflection.	Mirrors and objects to be seen.	Observing multiple images formed by mirrors placed at angles to each other. Making a kaleidoscope.
Why do we sometimes see colours on oil films on water?	Dispersion of light.	Plane mirror, water.	Observing spectrum obtained on a white sheet of paper/wall using a plane mirror inclined on a water surface at an angle of $45^\circ$ .
What is inside our eye that enables us to see?	Structure of the eye.	Model or chart of the human eye.	Observing reaction of pupil to a shining torch. Demonstration of blind spot.
Why are some people unable to see?	Lens becomes opaque, light not reaching the eye. Visually challenged	Experiences of children; case histories. Samples of Braille	Description of case histories of visually challenged people who have been doing

Questions	Key Concept	Resources	Activities/ Processes
<p><i>Night sky</i></p> <p>What do we see in the sky at night? How can we identify stars and planets?</p>	<p>use other senses to make sense of the world around.</p> <p>Alternative technology available.</p> <p>Role of nutrition in relation to blindness</p> <p>Idea about heavenly bodies/celestial objects and their classification – moon, planets, stars, constellations.</p> <p>Motion of celestial objects in space; the solar system</p>	<p>sheets.</p> <p>Observation of motion of objects in the sky during the day and at night; models, charts, role-play and games, planetarium.</p>	<p>well in their studies and careers. Activities with Braille sheet.</p> <p>Observing and identifying the objects moving in the sky during the day and at night.</p> <p>Observing and identifying some prominent stars and constellations.</p> <p>Observing and identifying some prominent planets, visible to the naked eye, (Venus, Mars, Jupiter) in the night sky and their movement.</p> <p>Design and preparing models and charts of the solar system, constellations, etc.</p> <p>Role- play and games for understanding movement of planets, stars etc.</p>

Questions	Key Concept	Resources	Activities/ Processes
<p><b><i>Earthquakes</i></b> What happens during an earthquake? What can we do to minimise its effects?</p>	Phenomena related to earthquakes.	Earthquake data; visit to seismographic centre.	Looking at structures/ large objects and guessing what will happen to them in the event of an earthquake; activities to explore stable and unstable structures.
<p><b>7. Natural Resources</b> <b><i>Man's intervention in phenomena of nature</i></b> What do we do with wood? What if we had no wood? What will happen if we go on cutting trees/grass without limit?</p>	Consequences of deforestation: scarcity of products for humans and other living beings, change in physical properties of soil, reduced rainfall. Reforestation; recycling of paper.	Data and narratives on deforestation and on movements to protect forests.	Narration and discussions. Project- Recycling of paper.
<p>What do we do with coal and petroleum? Can we create coal and petroleum artificially?</p>	Formation of coal and petroleum in nature. (fossil fuels?). Consequences of over extraction of coal and petroleum.	Background materials, charts etc.	Discussion.

Questions	Key Concept	Resources	Activities/ Processes
<p><b><i>Pollution of air and water</i></b></p> <p>What are the various activities by human beings that make air impure? Does clear, transparent water indicate purity?</p>	<p>Water and air are increasingly getting polluted and therefore become scarce for use. Biological and chemical contamination of water; effect of impure water on soil and living beings; effect of soil containing excess of fertilisers and insecticides on water resources. Potable water.</p>	<p>Description of some specific examples of extremely polluted rivers.</p>	<p>Case study and discussion. Purification of water by physical and chemical methods including using sunlight. Discussion on other methods of water purification.</p>



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