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Learning Outcomes

at
the Elementary Stage

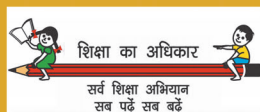


सत्यमेव जयते

विद्यया ऽ मृतमश्नुते



एन सी ई आर टी
NCERT



शिक्षा का अधिकार

सर्व शिक्षा अभियान
सब पढ़ें सब बढ़ें

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LEARNING OUTCOMES FOR THE ENGLISH LANGUAGE PRIMARY STAGE

Introduction

Language learning progresses naturally with exposure to and use of language. Language learning becomes meaningful when it is connected with the immediate environment of children. The English language is generally taught and learnt as a second language in India, in varied contexts and resources. At the primary stage, the teacher would need to factor in the pace of learning of children and the opportunities of exposure to English that they may have in their home and school environment.

Broadly, the curricular expectation of English language learning is the attainment of a basic proficiency for meaningful communication. While the use of home language need not be punished or penalised, particularly in Classes I and II, progression towards more use of English needs to be encouraged. The teacher is required to focus on providing learning opportunities to all learners, including the differently-abled and the disadvantaged, and ensure an inclusive environment.

Based on the curricular expectations for English language learning at the primary stage, a set of Learning Outcomes for each class has been developed. Teaching letters of the alphabet in isolation, or memorisation without understanding, is to be avoided. Reading Corners/class libraries may be developed to provide children relevant, illustrated and age-appropriate children's literature in English and home language. The teacher should observe children for assessment when they are engaged in activities, keeping in mind differently-abled children as well.

Errors should be viewed as attempts or stages of learning language. The teacher should facilitate stress-free correction through exposure to language input through story telling, input-rich environment, and above all, by providing a congenial atmosphere. The focus should be on developing interpersonal communication skills in English, and more importantly, a sensitivity towards languages and cultures other than their own.

In most places, children do not have exposure to English outside the classroom. The teacher's proficiency in spoken English in these cases becomes all the more essential. Students may listen to English and process the new language, before they actually begin to communicate in English.

Curricular Expectations

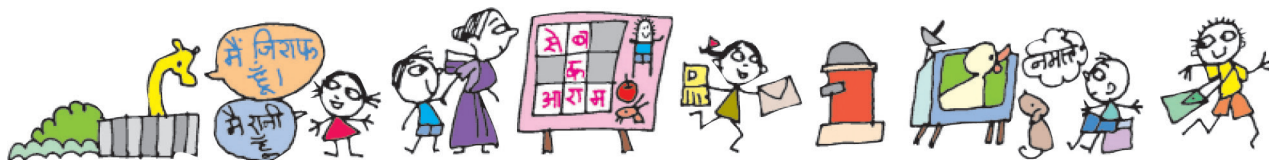
Children are expected to

- acquire the skills of listening, speaking, reading, writing and thinking in an integrated manner.
- develop interpersonal communication skills.
- attain basic proficiency like, developing ability to express one's thoughts orally and in writing in a meaningful way in English language.
- interpret and understand instructions and polite forms of expression and respond meaningfully both orally and in writing.
- develop reference skills both printed and electronic mode.
- acquire varied range of vocabulary; understand increased complexity of sentence structures both in reading and writing.
- express an awareness of social and environmental issues.
- read and interpret critically the texts in different contexts– including verbal (including Braille) and pictorial mode.



Class I (English)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs or groups/ individually and encouraged to–</p> <ul style="list-style-type: none"> • name common objects such as– man, dog etc. when pictures are shown • use familiar and simple words ('bat', 'pen', 'cat') as examples to reproduce the starting sound and letter (/b/, /p/, /k/ etc) • develop phonemic awareness through activities focusing on different sounds, emerging from the words in stories and texts • sing or recite collectively songs or poems or rhymes with actions • listen to stories, and humorous incidents and interact in English or home language • ask simple questions like names of characters from the story, incidents that he/she likes in the story, etc. (Ensure clear lip movement for children with hearing impairment to lip read.) • draw or scribble pictures and images from the story as preliminary to writing • respond in home language or English or sign language or non-verbal expressions what he/she has understood in the story or poem • listen to instructions and draws a picture • Use greetings like “Good morning”, “Thank you” and have polite conversations in English such as “What is your name?”, “How are you?” etc. • Say 2-3 sentences describing familiar objects and places such as family photographs, shops, parks etc. • Give examples of common blend sounds in words like <u>b</u>rick, <u>b</u>rother, <u>f</u>rog, <u>f</u>riend' etc. 	<p>The learner–</p> <ul style="list-style-type: none"> • associates words with pictures • Names familiar objects seen in the pictures • recognises letters and their sounds A—Z • differentiates between small and capital letters in print or Braille • recites poems/rhymes with actions • draws, scribbles in response to poems and stories • responds orally (in any language including sign language) to comprehension questions related to stories/poems • identifies characters and sequence of a story and asks questions about the story • carries out simple instructions such as 'Shut the door', 'Bring me the book', and such others • listens to English words, greetings, polite forms of expression, simple sentences, and responds in English or the home language or 'signing' (using sign language) • listens to instructions and draws a picture • talks about self /situations/ pictures in English • uses nouns such as 'boy', 'sun', and prepositions like 'in', 'on', 'under',etc. • produces words with common blends like “br” “fr” like 'brother', 'frog' etc. • writes simple words like fan, hen, rat etc.



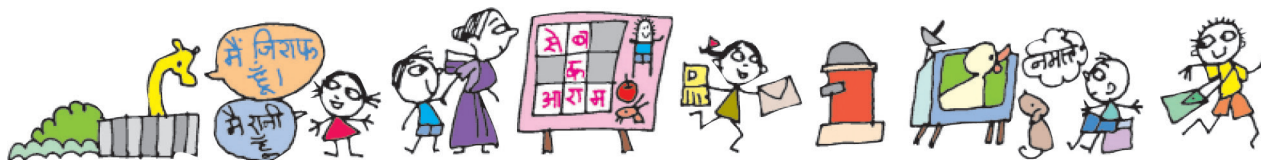
Class II (English)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to—</p> <ul style="list-style-type: none"> • sing or recite collectively songs or poems or rhymes with action • listen to stories, and humorous incidents and interact in English or home language • ask simple questions, for example, on characters, places, the sequence of events in the story, etc. (Ensure clear lip movement for children with hearing impairment to lip read.) • respond orally in home language or English or sign language or non-verbal expressions • write 2-3 simple sentences about stories or poems • look at scripts in a print rich environment like newspapers, tickets, posters etc. • develop phonemic awareness through activities focusing on different sounds, emerging from the words in stories and texts • listen to short texts from children’s section of newspapers, read out by the teacher • listen to instructions and draw a picture • speak and write English, talk to their peers in English, relating to festivals and events at homes and schools • enrich vocabulary in English mainly through telling and re-telling stories/folk tales • use appropriately pronouns related to gender such as ‘he’, ‘she’, ‘his’, ‘her’, and demonstrative pronouns such as ‘this’, ‘that’, ‘these’, ‘those’; and prepositions such as ‘before’, ‘between’ etc. • read cartoons/ pictures/comic strips with or without words independently • write 2-3 sentences describing common events using adjectives, prepositions and sight words like “This is my dog. It is a big dog. It runs behind me.” 	<p>The learner—</p> <ul style="list-style-type: none"> • sings songs or rhymes with action • responds to comprehension questions related to stories and poems, in home language or English or sign language, orally and in writing (phrases/ short sentences) • identifies characters, and sequence of events in a story. • expresses verbally her or his opinion and asks questions about the characters, storyline, etc., in English or home language. • draws or writes a few words or short sentence in response to poems and stories. • listens to English words, greetings, polite forms of expression, and responds in English/home language like ‘How are you?’, ‘I’m fine, thank you.’etc. • uses simple adjectives related to size, shape, colour, weight, texture such as ‘big’, ‘small’, ‘round’, ‘pink’ ‘red’ ‘heavy’ ‘light’ ‘soft’ etc. • listens to short texts from children’s section of newspapers, read out by the teacher • listens to instructions and draws a picture • uses pronouns related to gender like ‘his/ her/, ‘he/she’, ‘it’ and other pronouns like ‘this/that’, ‘here/there’ ‘these/those’ etc. • uses prepositions like ‘before’, ‘between” etc. • composes and writes simple, short sentences with space between words.



Class III (English)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to–</p> <ul style="list-style-type: none"> • sing songs or recite poems in English with intonation • participate in role play, enactment of skits • read aloud short texts/ scripts on the walls, with pronunciation and pause • listen to and communicate oral / telephonic messages • collect books for independent reading in English and other languages/Braille with a variety of themes (adventure, stories, fairy tales, etc.) • read posters, tickets, labels, pamphlets, newspapers etc. • take dictation of words/phrases/ sentences short paragraphs from known and unknown texts • draw and write short sentences related to stories read, and speak about their drawing or writing work • raise questions on the text read • enrich vocabulary in English through listening to and reading stories/folk tales • use nouns, pronouns, adjectives and prepositions in speech and writing • use terms such as ‘add’, ‘remove’, ‘replace’, etc., that they come across in Maths, and words such as ‘rain’, ‘build’ in EVS • identify opposites and use in communication, for example ‘tall/short’, ‘inside/outside’, ‘fat/thin’ etc. 	<p>The learner:</p> <ul style="list-style-type: none"> • recites poems individually/ in groups with correct pronunciation and intonation. • performs in events such as role play/ skit in English with appropriate expressions • reads aloud with appropriate pronunciation and pause • reads small texts in English with comprehension i.e., identifies main idea, details and sequence and draws conclusions in English • expresses orally her/his opinion/ understanding about the story and characters in the story, in English/ home language. • responds appropriately to oral messages/ telephonic communication • writes/types dictation of words/phrases/ sentences • uses meaningful short sentences in English, orally and in writing.uses a variety of nouns, pronouns, adjectives and prepositions in context as compared to previous class • distinguishes between simple past and simple present tenses • identifies opposites like ‘day/night’, ‘close-open’, and such others • uses punctuation such as question mark, full stop and capital letters appropriately • reads printed scripts on the classroom walls: poems, posters, charts etc. • writes 5-6 sentences in English on personal experiences/events using verbal or visual clues • uses vocabulary related to subjects like Maths, EVS, relevant to class III.



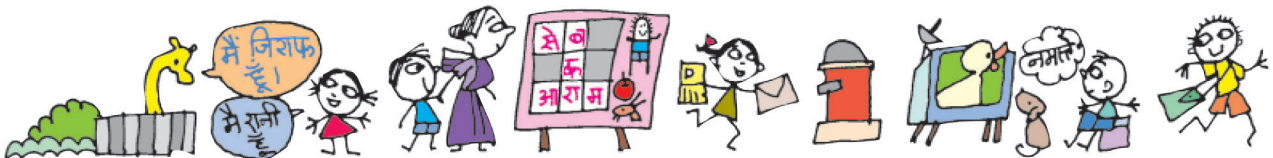
Class IV (English)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to–</p> <ul style="list-style-type: none"> • participate in role play, enactment, dialogue and dramatisation of stories read and heard • listen to simple instructions, announcements in English made in class/school and act accordingly • participate in classroom discussions on questions based on the day to day life and texts he/she already read or heard • learn English through posters, charts, etc., in addition to books and children’s literature • read independently and silently in English/ Braille, adventure stories, travelogues, folk/ fairy tales etc. • understand different forms of writing (informal letters, lists, stories, diar entry etc.) • learn grammar in a contextual and integrated manner and frame grammatically correct sentences • notice the use of nouns, pronouns, adjectives, prepositions and verbs in speech and writing and in different language activities. • notice categories and word clines • enrich vocabulary in English mainly through telling and re-telling stories/folk tales • start using dictionary to find out spelling and meaning • practise reading aloud with pause and intonation, with an awareness of punctuation (full stop, comma, question mark); also use punctuation appropriately in writing • infer the meaning of unfamiliar words from the context • take dictation of words/phrases/sentences/ short paragraphs from known and unknown texts • be sensitive to social and environmental issues such as gender equality, conservation of natural resources, etc. • look at cartoons/pictures/comic strips with or without words and interpret them 	<p>The learner–</p> <ul style="list-style-type: none"> • recites poems with appropriate expressions and intonation. • enacts different roles in short skits • responds to simple instructions, announcements in English made in class/ school • responds verbally/in writing in English to questions based on day-to-day life experiences, an article, story or poem heard or read • describes briefly, orally/in writing about events, places and/or personal experiences in English • reads subtitles on TV, titles of books, news headlines, pamphlets and advertisements • shares riddles and tongue-twisters in English • solves simple crossword puzzles, builds word chains, etc. • infers the meaning of unfamiliar words by reading them in context • uses dictionary to find out spelling and meaning • writes/types dictation of short paragraphs (7-8 sentences) • uses punctuation marks appropriately in reading aloud with intonations and pauses such as question mark, comma, and full stop • uses punctuation marks appropriately in writing such as question mark, comma, full stop and capital letters • writes informal letters or messages with a sense of audience • uses linkers to indicate connections between words and sentences such as ‘First’, ‘Next’, etc. • uses nouns, verbs, adjectives, and prepositions in speech and writing • reads printed script on the classroom walls, notice board, in posters and in advertisements



- enrich vocabulary through crossword puzzles, word chain, etc.
- appreciates verbally and in writing the variety in food, dresses and festivals as read/heard in his/her day to day life and story book, seen in videos, films, etc.

- speaks briefly on a familiar issue like conservation of water; and experiences of day to day life like visit to a zoo; going to a *mela*
- presents orally and in writing the highlights of a given written text / a short speech / narration / video, film, pictures, photograph etc.



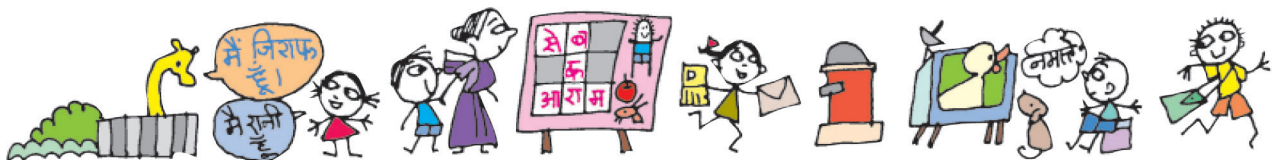
Class V (English)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to–</p> <ul style="list-style-type: none"> • discuss and present orally, and then write answers to text-based questions, short descriptive paragraphs • participate in activities which involve English language use, such as role play, enactment, dialogue and dramatisation of stories read and heard • look at print-rich environment such as newspapers, signs and directions in public places, pamphlets, and suggested websites for language learning • prepare speech for morning assembly, group discussions, debates on selected topics, etc. • infer the meaning of unfamiliar words from the context while reading a variety of texts • refer to the dictionary, for spelling, meaning and to find out synonyms and antonyms • understand the use of synonyms, such as ‘big/large’, ‘shut/ close’, and antonyms like inside/outside, light/dark from clues in context • relate ideas, proverbs and expressions in the stories that they have heard, to those in their mother tongue/surroundings/cultural context • read independently and silently in English/ Braille, adventure stories, travelogues, folk/ fairy tales etc. • find out different forms of writing (informal letters, lists, stories leave application, notice etc.) • learn grammar in a context and integrated manner (such as use of nouns, adverbs; differentiates between simple past and simple present verbs.) • use linkers to indicate connections between words and sentences such as ‘Then’, ‘After that’, etc. • take dictation of sort texts such as lists, paragraphs and dialogues. • enrich vocabulary through crossword puzzles, word chain etc. 	<p>The learner–</p> <ul style="list-style-type: none"> • answers coherently in written or oral form to questions in English based on day-to-day life experiences, unfamiliar story, poem heard or read. • recites and shares English songs, poems, games, riddles, stories, tongue twisters etc, recites and shares with peers and family members. • acts according to instructions given in English, in games/sports, such as ‘Hit the ball!’ ‘Throw the ring.’ ‘Run to the finish line!’ etc. • reads independently in English storybooks, news items/ headlines, advertisements etc. talks about it, and composes short paragraphs • conducts short interviews of people around him e.g interviewing grandparents, teachers, school librarian, gardener etc. • uses meaningful grammatically correct sentences to describe and narrate incidents; and for framing questions • uses synonyms such as ‘big/large’, ‘shut/ close’, and antonyms like inside/outside, light/dark from clues in context • reads text with comprehension, locates details and sequence of events • connects ideas that he/she has inferred, through reading and interaction, with his/ her personal experiences • takes dictation for different purposes, such as lists, paragraphs, dialogues etc. • uses the dictionary for reference • identifies kinds of nouns, adverbs; differentiates between simple past and simple present verbs • writes paragraphs in English from verbal, visual clues, with appropriate punctuation marks and linkers • writes a ‘mini biography’ and ‘mini autobiography’ • writes informal letters, messages and e-mails • reads print in the surroundings (advertisements, directions, names of places etc), understands and answers queries



- look at cartoons/ pictures/ comic strips with or without words and speak/write a few sentences about them.
- write a 'mini biography' and 'mini autobiography'

- attempts to write creatively (stories, poems, posters, etc)
- writes and speaks on peace, equality etc suggesting personal views
- appreciates either verbally / in writing the variety in food, dress, customs and festivals as read/heard in his/her day-to day life, in storybooks/ heard in narratives/ seen in videos, films etc.



LEARNING OUTCOMES FOR THE ENGLISH LANGUAGE UPPER PRIMARY STAGE

Introduction

Language learning progresses naturally with exposure to and use of language in meaningful contexts. The learner needs to notice and use language in and outside the classroom in order to become a proficient user of language. English language is taught and learnt as a second language in varied contexts and resources for teaching-learning in terms of the proficiency of the English language teacher, materials (textbooks and other supplementary materials), the English language environment in the school and so on. Language learning is meaningful when it is connected with the immediate environment of children. The activities / tasks in the textbook and the tasks carried out by the teacher need to take into consideration the lived-in experiences of learners. The English language learning outcomes are intended to be achieved by every child so as to enable them to be proficient users of language in real life situations. Broadly, the goals of language learning which could be achieved include: attainment of basic proficiency in language for effective communication and development of language for knowledge acquisition. i.e. using language as a tool for learning the content subjects. However the teacher should have flexibility and consider the pace of learning of children as well as their opportunities of learning English at home and in school.

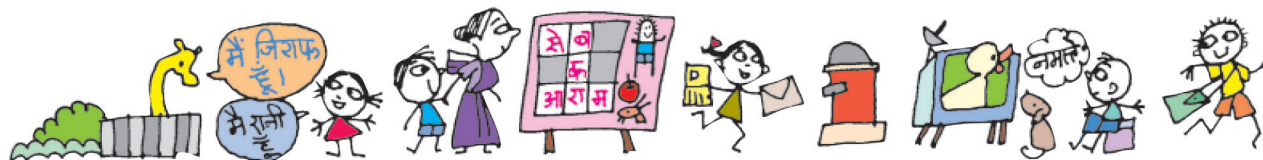
The learning outcomes are listed are not restrictive or limited; they are the launching pads for developing skills and competencies in learners of the English language in classes VI, VII and VIII. Teachers may add activities to achieve the outcomes. Pedagogical Processes are also given along with the Learning Outcomes to emphasise the process of learning, and active participation of learners. The suggested activities/ exercises are to scaffold the process of language acquisition. This is mainly to support teachers in creating learning opportunities for learners.

The teacher should observe children for assessment when they are engaged in activities, keeping in mind differently-abled children as well. Assessment should be an integral part of the teaching-learning process and not a year-end examination only.

Curricular Expectations

Children are expected to:

- acquire the ability to listen and respond orally and in writing/Lip reads where necessary.
- speak about self, simple experiences; report events to peers, accurately and appropriately make connections and draw inferences.
- recite poems, dialogues; speak and write language chunks (phrases, sentences from stories, plays, speeches, etc.)
- understand the central idea and locate details in the text (familiar and unfamiliar).
- use his/her critical/thinking faculty to read between the lines and go beyond the text.
- comprehend and uses the form and functions of grammar in context.
- write coherently and with a sense of audience (formal and informal)
- write simple messages, invitations, short paragraphs, letter (formal and informal), applications, personal diary, dialogue from story and story from a dialogue/conversation in English and in Braille
- engage in creative writing e.g. composition of poems, jokes, short stories, etc.
- develop sensitivity towards their culture and heritage, aspects of contemporary life, gender, and social inequality



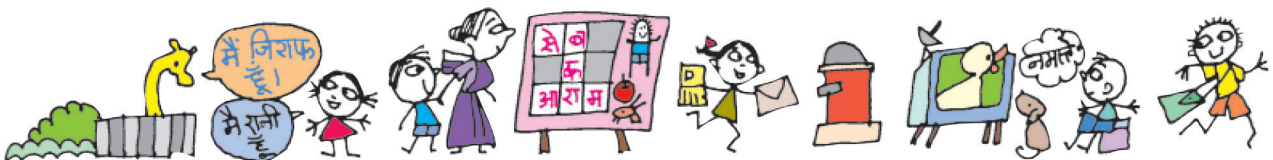
Class VI (English)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to–</p> <ul style="list-style-type: none"> • become familiar with songs/poems/prose in English through input-rich environment, interaction, classroom activities, discussion etc. • listen to English news(TV, Radio) as a resource to develop listening comprehension • watch/ listen to English movies, serials, educational channels with sub-titles, audio-video materials, talking books, teacher reading out from materials and to understand and respond • participate in individual talk viz. introducing oneself and other persons; participate in role play / make a speech, reproduce speeches of great speakers • summarise orally the stories, poems and events that he/she has read or heard • locate sequence of ideas, events and identify main idea of a story/poem through various types of comprehension questions • read different kinds of texts such as prose, poetry, play for understanding and appreciation and write answers for comprehension and inferential questions • raise questions based on their reading • interpret tables, charts, diagrams and maps and write a short paragraph • think critically and try to provide suggestion/ solutions to the problems raised • read/ discuss the ideas of the text for critical thinking • use dictionary as a reference book for finding multiple meanings of a word in a variety of contexts • take dictation of words, phrases, simple sentences and short paragraphs • understand the use of antonym (impolite/ polite) synonym (big/large) and homonym (tail/tale) 	<p>The learner–</p> <ul style="list-style-type: none"> • participates in activities in English like role play, group discussion, debate, etc. • recites and shares poems, songs, jokes, riddles, tongue twisters, etc. • responds to oral messages, telephonic communication in English and communicates them in English or home language. • responds to announcements and instructions made in class, school assembly, railway station and in other public places • reads a variety of texts in English / Braille and identifies main ideas, characters, sequence of ideas and events and relates with his/her personal experiences • reads to seek information from notice board, newspaper, Internet, tables, charts, diagrams and maps etc. • responds to a variety of questions on familiar and unfamiliar texts verbally and in writing • uses synonyms, antonyms appropriately deduces word meanings from clues in context while reading a variety of texts • writes words / phrases / simple sentences and short paragraphs as dictated by the teacher • uses meaningful sentences to describe / narrate factual / imaginary situations in speech and writing • refers to dictionary to check meaning and spelling, and to suggested websites for information • writes grammatically correct sentences for a variety of situations, using noun, pronoun, verb, adverb, determiners, etc. • drafts, revises and writes short paragraphs based on verbal, print and visual clues • writes coherently with focus on appropriate beginning, middle and end in English / Braille • writes messages, invitations, short paragraphs and letters (formal and informal) and with a sense of audience



- understand the grammatical forms in context/ through reading e.g. Noun, pronoun, verb, adverb, determiners, etc.
- understand the context for various types of writing such as messages, notices, letters, report, biography, diary entry, travelogue etc.
- draft, revise and write in English / Braille with punctuation and with focus on appropriate beginning, middle and end
- use ICT (Net, mobile, website, Youtube, TED talks etc) to browse for information, for projects/PPT etc.
- look at cartoons/ pictures/comic strips with or without words, and talk/write about them
- visit a language laboratory
- write a Book Review.

- visits a language laboratory
- writes a Book Review.

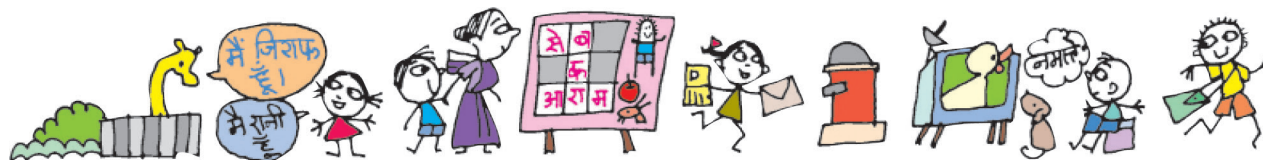


Class VII (English)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs groups/ individually and encouraged to–</p> <ul style="list-style-type: none"> • consciously listen to songs/poems/stories/ prose texts in English through interaction and being exposed to print-rich environment • participate in different events/ activities in English in the classroom, school assembly; and organised by different Institutions • listen to English news and debates (TV, Radio) as input for discussion and debating skills • watch and listen to English movies, serials, educational channels with sub-titles, audio-video materials, teacher reading out from materials and eminent speakers • share their experiences such as journeys, visits, etc. in pairs /groups • introduce self, converse with other persons, participate in role play / make speeches, reproduce speeches of great speakers • summarise orally and in writing a given text, stories, or an event • learn vocabulary associated with various professions (e.g. cook, cobbler, farmer, blacksmith, doctor etc) • read stories / plays (from books/ other sources in English / Braille) and locate details, sequence of ideas and events and identify main idea • use material from various sources in English and other languages to facilitate comprehension and co-relation • understand the rules of grammar through a variety of situations and contexts focussing on noun, pronoun, verb, determiners, time and tense, passivisation, adjective, adverb, etc. • interpret tables, charts, diagrams and maps, and incorporate the information in writing • think critically on inputs based on reading and interaction and try to provide suggestion/solutions to the problems 	<p>The learner–</p> <ul style="list-style-type: none"> • answers questions orally and in writing on a variety of texts • reads aloud stories and recites poems with appropriate pause, intonation and pronunciation • participates in different activities in English such as role play, poetry recitation, skit, drama, debate, speech, elocution, declamation, quiz, etc., organised by school and other such organisations • engages in conversations in English with family, friends, and people from different professions such as shopkeeper, salesperson etc. using appropriate vocabulary • responds to different kinds of instructions, requests, directions in varied contexts viz. school, bank, railway station • speaks about excerpts, dialogues, skits, short films, news and debate on TV and radio, audio–video programmes on suggested websites • asks and responds to questions based on texts (from books or other resources) and out of curiosity • reads textual/non-textual materials in English/Braille with comprehension • identifies details, characters, main idea and sequence of ideas and events in textual / non-textual material • thinks critically, compares and contrasts characters, events, ideas, themes and relates them to life • reads to seek information in print / online, notice board, signboards in public places, newspaper, hoardings etc. • takes notes while teacher teaches /from books / from online materials. • infers the meaning of unfamiliar words by reading them in context • refers dictionary, thesaurus and encyclopedia to find meanings / spelling of words while reading and writing



- raised. (The themes could be social issues, environment problems, appreciation of culture and crafts)
- refer sources such as dictionary, thesaurus and encyclopedia to facilitate reading
 - read text, both familiar and unfamiliar, and write answers for comprehension and inferential questions
 - take dictation of a paragraph with a variety of sentence structures.
 - draft, revise and write with appropriate beginning, middle and end, along with punctuation marks
 - know the features of various types of writing: messages, emails, notice, letter, report, short personal/ biographical experiences etc.
 - use ICT (Net, mobile, website, Youtube, TED talks etc) to browse for information, for projects/PPT discussion, debate etc.
 - attempt creative writing, like stories, poems, dialogues, skits etc.
 - visit a language laboratory
 - write a Book Review.
- reads a variety of texts for pleasure e.g. adventure stories and science fiction, fairy tales, biography, autobiography, travelogue etc. (extensive reading)
 - uses appropriate grammatical forms in communication (e.g. noun, pronoun, verb, determiners, time and tense, passivisation, adjective, adverb, etc)
 - organises sentences coherently in English / in Braille with the help of verbal and visual clues and with a sense of audience
 - writes formal letters, personal diary, list, email, SMS, etc.
 - writes descriptions / narratives showing sensitivity to gender, environment and appreciation of cultural diversity
 - writes dialogues from a story and story from dialogues
 - visits a language laboratory.
 - writes a Book Review.



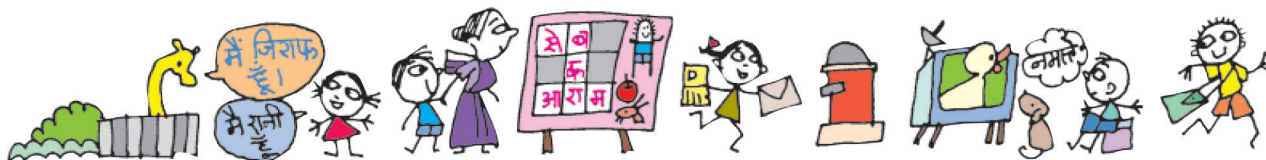
Class VIII (English)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to–</p> <ul style="list-style-type: none"> • participate in classroom activities/ school programmes such as Morning Assembly/ extempore/debate etc. by being exposed to input-rich environment • speak about objects / events in the class / school environment and outside surroundings. • participate in grammar games and kinaesthetic activities for language learning. • use English news (newspaper, TV, Radio) as a resource to develop his/her listening and reading comprehension, note-taking, summarizing etc. • watch / listen to English movies, serials, educational channels with sub-titles, audio-video/ multi-media materials, for understanding and comprehension. • interview people from various professions such as doctors, writers, actors, teachers, cobblers, newspaper boy, household helps, rickshaw pullers and so on. • use formulaic expressions / instructions such as ‘Could I give you...’ ‘Shall we have a cup of tea?’ to develop communication skills • participate in individual activities such as introducing personalities/ guests during school programmes. • learn vocabulary associated with various professions and use them in different situations. • read stories / plays (from different books/ newspapers in education (NIE) / children’s section in magazines in English / Braille) and narrate them. • locate main idea, sequence of events and co-relate ideas, themes and issues in a variety of texts in English and other languages. • use various sources from English and other languages to facilitate comprehension, co-relation and critical understanding of issues. • interpret quotations, sayings and proverbs. 	<p>The learner–</p> <ul style="list-style-type: none"> • responds to instructions and announcements in school and public places viz. railway station, market, airport, cinema hall, and act accordingly. • introduces guests in English, interviews people by asking questions based on the work they do. • engages in conversations in English with people from different professions such as bank staff, railway staff, etc. using appropriate vocabulary. • uses formulaic/polite expressions to communicate such as ‘May I borrow your book?’, ‘I would like to differ’ etc. • speaks short prepared speech in morning assembly. • speaks about objects / events in the class / school environment and outside surroundings. • participates in grammar games and kinaesthetic activities for language learning. • reads excerpts, dialogues, poems, commentaries of sports and games speeches, news, debates on TV, Radio and expresses opinions about them. • asks questions in different contexts and situations (e.g. based on the text / beyond the text / out of curiosity / while engaging in conversation using appropriate vocabulary and accurate sentences) • participates in different events such as role play, poetry recitation, skit, drama, debate, speech, elocution, declamation, quiz, etc., organised by school and other such organizations; • narrates stories (real or imaginary) and real life experiences in English. • interprets quotations, sayings and proverbs. • reads textual/non-textual materials in English/Braille with comprehension. • identifies details, characters, main idea and sequence of ideas and events while reading. • reads, compares, contrasts, thinks critically and relates ideas to life.



- interpret photographs/sketches, tables, charts, diagrams and maps and incorporate in writing.
- think critically, compare and contrast characters/events/ideas/themes and relate them to life and try to give opinions about issues.
- refer sources such as dictionary, thesaurus and encyclopedia for meaning in context and understanding texts.
- use grammar in context such as active and passive voice, reported speech, tenses, parts of speech, etc.
- notice punctuation marks in a variety of texts and appropriately use in editing his/ her own writing.
- understand the context for various types of writing: messages, notice, letter, report, biography, travelogue, diary entry etc.
- take dictation of a passage with specific attention to words pronounced, punctuation and spelling.
- attempt various types of writing: notice, letter, report, etc as well as personal/ biographical experiences and extrapolative writings.
- use ICT (Net, mobile, website, Youtube, TED talks etc) to browse for information, for projects/PPT discussion, debate, class seminar etc.
- attempt creative writing, like stories, poems, dialogues, skits, dialogues from a story and story from dialogues.
- visit a language laboratory.
- write a Book Review.

- infers the meaning of unfamiliar words by reading them in context.
- reads a variety of texts for pleasure e.g. adventure stories and science fiction, fairy tales, also non-fiction articles, narratives, travelogues, biographies, etc. (extensive reading)
- refers dictionary, thesaurus and encyclopedia as reference books for meaning and spelling while reading and writing.
- prepares a write up after seeking information in print / online, notice board, newspaper, etc.
- communicates accurately using appropriate grammatical forms (e.g., clauses, comparison of adjectives, time and tense, active passive voice, reported speech etc.)
- writes a coherent and meaningful paragraph through the process of drafting, revising, editing and finalising.
- writes short paragraphs coherently in English/Braille with a proper beginning, middle and end with appropriate punctuation marks.
- writes answers to textual/non-textual questions after comprehension / inference; draws character sketch, attempts extrapolative writing.
- writes email, messages, notice, formal letters, descriptions/ narratives, personal diary, report, short personal/ biographical experiences etc.
- develops a skit (dialogues from a story) and story from dialogues.
- visits a language laboratory.
- writes a Book Review.



For Children with Special Needs (Languages)

- Multilingualism, which is constitutive of the identity of a child and a typical feature of the Indian linguistic landscape, must be used as a resource, and classroom strategies planned accordingly by a creative language teacher. This is not only the best use of a resource readily available, but also a way of ensuring that every child feels secure and accepted, and that no one is left behind on account of her/his linguistic background (NCF, 2005). The hiatus between the home language of the tribal child and the state language medium of the school poses a problem for Children from Scheduled Tribes. A transition to regional and other languages including English will be facilitated through learning in the home language of the child.
- Where there is more than one tribal language used in any area, the use of the regional lingua franca or the majority language is preferred.
- Some children may have specific difficulties in learning languages and may require help in their areas of weaknesses and in devising strategies to overcome their difficulties.
- There may be some children who may require alternative communication systems to compensate for the difficulties they face in using spoken language.
- Children having difficulties in writing may need to make use of ICT, while there may be some who may require opportunities to learn and develop a tactile method of interpreting written information. Content related to real-life situations would benefit all children.
- Sign language and Braille may find a place in school education, and this would not only help students with SEN in language learning, but also create awareness and sensitivity amongst children without SEN.

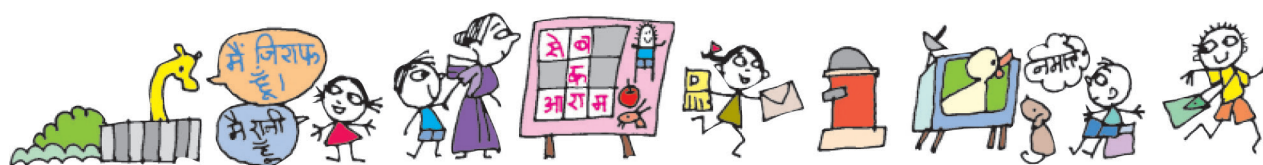
Care may be taken for the following aspects for children with Special Educational Needs for which they may need more time and individualised attention.

For Children with Visual Impairments (VI)

- Long passages and learning from visualised inputs
- Taking more time in interpreting meaning as reading in Braille requires more time and involves great amount of memorising and synthesising since wholeness of phrases, sentences etc. is not possible.

For Children with Hearing Impairments (HI)

- Comprehending new vocabulary



- Discriminating between words
- Understanding words with multiple meanings
- Forming connections between ideas or concepts
- Organising thoughts or composing ideas. Composing ideas involves producing grammatically and semantically correct text at one time which may be difficult for these learners
- Understanding and using phrases
- Grammar usage (past tense, prepositions, active and passive construction)
- Sentence construction.

For Children with Cognitive Impairments, Intellectual Disability

- Oral language (listening, expressing ideas and/or speaking) and articulation (ability to speak fluently and coherently)
- Reading (including decoding, phonetic knowledge and word recognition). The student may skip words, lose place, mistake one word for another, etc.
- Eye hand coordination and writing (illegible handwriting, frequent spelling errors)
- Organising thoughts, making revisions etc., pronouncing words and/or sequencing a story
- Language comprehension (new vocabulary, sentence structure, words with different meanings and concepts) especially when presented rapidly, leading to difficulty in taking class notes
- Understanding figurative language– idioms, metaphors, similes, etc.



LEARNING OUTCOMES IN MATHEMATICS

ELEMENTARY STAGE

Introduction

Various educational surveys and achievement data over the years show that learning achievements of children in various subjects--especially Mathematics-- are not up to the expected levels despite all the efforts made by States/ UTs. It is a fact that many a time, teachers complete the syllabus as per the textbook, but they do not have a clear idea about the kind of learning they expect from children in various subjects including Mathematics.

'Curricular expectations' define what a child should know and be able to do as well as the dispositions that should be acquired over a period of time. The learning outcomes derived from the curricular expectations and the syllabus may help all the stakeholders in understanding the goals to be achieved. The learning outcomes are generally treated as assessment standards or benchmarks for assessment.

Highlighting the end product of the learning process generally leads to it being achieved through rote memorisation without understanding. However, the highlighting of the end product in mathematics learning, lays emphasis on remembering the facts and using algorithms without understanding. Further, it develops a handicap in children about use and applications of mathematical ideas in daily life. The integration of the environmental component with mathematics has been taken up. The teachers are expected to provide learning opportunities while transacting different concepts of mathematics to help children explore and connect with their immediate surroundings, (self, family, school etc). The suggested pedagogical processes include examples for the same.

Learning is a continuous process. The learning outcomes are impacted by the learning /pedagogical processes used to develop competencies. The learners are expected to realise and use mathematics as an important tool that they can talk about, use and explore as well as understand its structure. Therefore, this document lists the learning outcomes in Mathematics for Classes I to VIII along with some suggested pedagogical processes which may be undertaken to achieve the outcomes. These pedagogical processes are not exhaustive. Also, they are suggestive in nature, and may vary according to the learners' context. An innovative and creative teacher may be able to achieve the learning outcomes through these and many more different pedagogical processes.

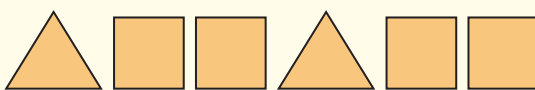
Curricular Expectations

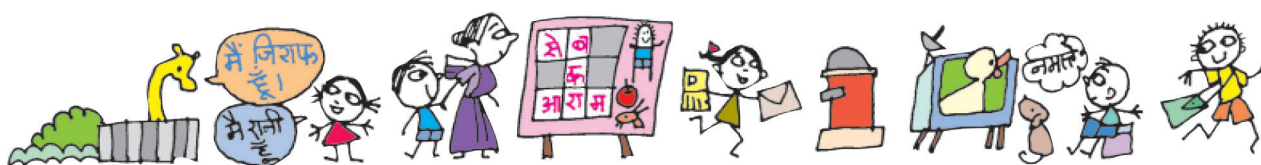
Children are expected to

- Develop a connection between daily life contexts and mathematical thinking.
- understand shapes and articulate their observable properties as similarities and differences among them.
- develop own methods of performing operations on numbers in daily life (addition, subtraction, multiplication and division).
- develop language and symbolic notations with standard algorithms of performing number operations.
- estimate outcome of operations on two or more numbers and use it in daily life activities.
- learn to represent the part of a whole as a fraction and order simple fractions.
- collect , represent and interpret simple data from her/his contexts and use it in everyday life.
- identify and extend simple patterns in shapes and numbers.



Class I (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to —</p> <ul style="list-style-type: none"> observe different contexts and situations from the immediate environment such as things that are inside/outside the classroom. They may be encouraged to use spatial vocabulary/ concepts like top-bottom, on-under, inside-outside, above-below, near-far, before-after, thin- thick, big-small etc. identify and draw the things which are near-far, tall-short, thick-thin, etc. handle concrete materials or models and classify them. For example, objects which are round in shape such as chapati, ball, etc and those which are not round such as pencil box. count objects, for instance, students may take out objects up to 9 from a given collection of objects such as picking any 8 leaves /4 beads/6 ice-cream sticks etc, from the given box. take out objects up to 20 from a given collection of objects use words like more than, less than or equal through the strategy of one to one correspondence in objects in two groups explore different strategies to add numbers up to 9 like counting on forward and using already known addition facts evolve different strategies to subtract numbers up to 9 as for example, recounting after taking out objects from a given collection use different strategies like aggregation, counting forward, using addition facts, etc. to extend addition up to 20 (sum not exceeding 20) develop different strategies of subtraction through taking away objects/ pictures count in groups of tens and ones for numbers more than 20 e.g. 38 has 3 groups/bundles of ten each and 8 loose (ones) 	<p>The learner —</p> <ul style="list-style-type: none"> classifies objects into groups based on a few physical attributes such as shape, size and other observable properties including rolling and sliding recites number names and counts objects up to 20, concretely, pictorially and symbolically works with numbers 1 to 20 <ul style="list-style-type: none"> counts objects using numbers 1 to 9 compares numbers up to 20. For example tells whether number of girls or number of boys is more in the class applies addition and subtraction of numbers 1 to 20 in daily life <ul style="list-style-type: none"> constructs addition facts up to 9 by using concrete objects. For example to find $3+3$ counts 3 steps forward from 3 and concludes that $3+3=6$ subtracts numbers using 1 to 9. For example the child takes out 3 objects from a collection of 9 objects and counts the remaining to conclude $9-3=6$ solves day-to-day problems related to addition and subtraction of numbers up to 9 recognises numbers up to 99 and writes numerals describes the physical features of various solids/shapes in her own language. For example- a ball rolls, a box slides etc. estimates and measures short lengths using non uniform units like a finger, hand span, length of a forearm, footsteps, etc. observes, extends and creates patterns of shapes and numbers. For example, arrangement of shapes/ objects/ numbers, etc.:- <ul style="list-style-type: none">  1,2,3,4,5,... 1,3,5,... 2,4,6,..... 1,2,3,1,2,...., 1,...3,.....



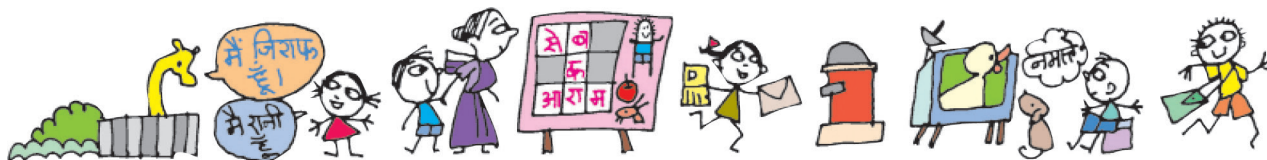
- sort objects based on similarities and differences through their sense of touch and observations
- verbalise the properties of shapes/criterion used by them in sorting/ classifying solids/ shapes
- use concrete play money for making amounts up to Rs 20
- finds short lengths in their immediate environment using non uniform units like finger, hand span, length of a forearm, footsteps, etc.
- conduct classroom discussions on learner observations of pattern and allow them to describe in their own language. Let children find what will come next and justify their answer
- observe and collect information from the visuals, contexts/ situations such as number of items.

- collects, records (using pictures/numerals) and interprets simple information by looking at visuals. (For example in a picture of a garden the child looks at different flowers and draws inference that flowers of a certain colour are more).
- develops the concept of zero.



Class II (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to —</p> <ul style="list-style-type: none"> • identify number naming and number writing patterns, read and write numbers up to 99 • apply the understanding of place value of numbers while grouping & recognising them • add 2 digit numbers up to 99 by using addition facts up to 9 • develop and use alternate strategies for addition and subtraction of numbers • explore situations in which addition and subtraction of numbers is required. For example combining two groups, enlarging a group by adding more objects • develop their own contextual situations/ questions based on subtraction and addition • create situation/ context in which a number has to be repeatedly added • trace different faces of 3D objects on paper and name their corresponding 2D Shapes • classify shapes based on their physical attributes through cut out/ paper folds of different shapes • use observations/ sense of touch to describe the shapes and their physical attributes • add up to numerical value of Rs. 100, by using concrete play money of different denominations • measure different lengths/ distances by using uniform but non-standard unit • discuss and share the experiences of children while they observe different balances for weighing objects • construct their own balance (simple) and weigh and compare the weights of different things around them • compare the capacity of two or more containers • discuss about the special day/ particular day of a week when children share time and house related work with their family members 	<p>The learner —</p> <ul style="list-style-type: none"> • works with two digit numbers <ul style="list-style-type: none"> – reads and writes numerals for numbers up to 99 – uses place value in writing and comparing two digit numbers. – forms the greatest and smallest two digit numbers (with and without repetition of given digits) – solves simple daily life problems/ situations based on addition of two digit numbers – solves daily life situations based on subtraction of two digit numbers – represents an amount up to Rs. 100 using 3-4 notes and coins (of same/ different denominations of play money) • describes basic 3D and 2D shapes with their observable characteristics <ul style="list-style-type: none"> – identifies basic 3D-shapes such as cuboid, cylinder, cone and sphere by their names – distinguishes between straight and curved lines – draws/ represents straight lines in various orientations (vertical, horizontal, slant) • estimates and measures length/distances and capacities of containers using uniform non-standard units like a rod/pencil, cup/spoon/bucket etc. • compares objects as heavier/lighter than using simple balance. • identifies the days of the week and months of the year • sequences the events occurring according to their duration in terms of hours/days; for example, Does a child remain in school for a longer period than at home? • draws inference based on the data collected such as the number of vehicles used in Samir's house is more than that in Angelina's.

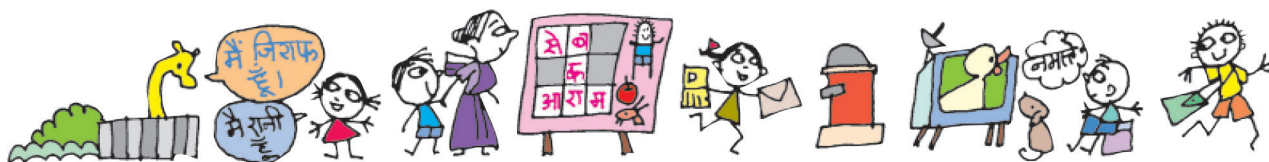


- verbalise the unit of repeat in a pattern and make ideas about their extension
- extend patterns created by using shapes, thumb print, leaf print and numbers, etc.
- collect information from people around, record it and draw some inference from it.



Class III (Mathematics)


Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to —</p> <ul style="list-style-type: none"> count large number of objects from their surroundings by making groups of 100,10 and ones write a number (up to 999) and the other group reads it. apply place values for writing greatest/smallest numbers with three digits. (Digits may or may not repeat.) arrange concrete objects and draw different multiplication facts/ combinations of a given number, for example 6 mangoes can be arranged as <div style="text-align: center;"> </div> <ul style="list-style-type: none"> develop multiplication facts of 2, 3, 4, 5 and 10 using different ways e.g., <ul style="list-style-type: none"> Skip counting <div style="text-align: center;"> </div> <ul style="list-style-type: none"> and by using repeated addition experience equal sharing and grouping and connecting them mathematically in their own context. for example, sharing of equal number of sweets among children observe various 3D shapes available in the surroundings and discussions may be held for identification of similarities and differences with respect to their corresponding 2D. Shapes like triangle, square, circle cut outs of cardboard make 2D shapes through paper folding/ paper cutting activities describe the properties of 2D shapes in their own words/languages like number of corners, edges on a shape, etc. 	<p>The learner —</p> <ul style="list-style-type: none"> works with three digit numbers <ul style="list-style-type: none"> reads and writes numbers up to 999 using place value compares numbers up to 999 for their value based on their place value solves simple daily life problems using addition and subtraction of three digit numbers with and without regrouping, sums not exceeding 999 constructs and uses the multiplication facts (tables) of 2, 3, 4, 5 and 10 in daily life situations analyses and applies an appropriate number operation in the situation/ context explains the meaning of division facts by equal grouping/sharing and finds it by repeated subtraction. For example, $12 \div 3$ can be explained as number of groups of 3 to make 12 and finds it as 4 by repeatedly subtracting 3 from 12 adds and subtracts small amounts of money with or without regrouping makes rate charts and simple bills acquires understanding about 2D shapes <ul style="list-style-type: none"> identifies and makes 2D-shapes by paper folding , paper cutting on the dot grid, using straight lines etc. describes 2D shapes by the number of sides, corners and diagonals. For example, the shape of the book cover has 4 sides, 4 corners and two diagonals fills a given region leaving no gaps using a tile of a given shape estimates and measures length and distance using standard units like centimetres or metres and identifies relationships weighs objects using standard units– grams and kilograms using simple balance compares the capacity of different containers in terms of non standard units adds and subtracts measures involving grams & kilograms in life situations identifies a particular day and date on a calendar

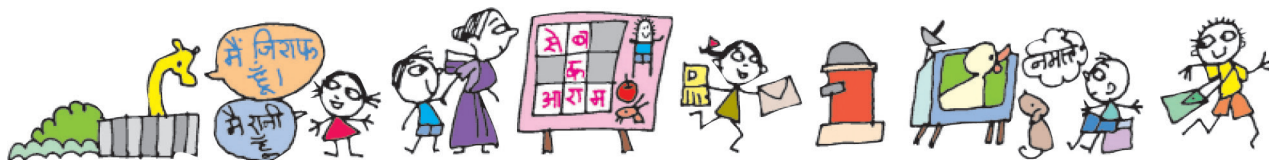


- discuss their observation regarding various shapes they observe in their surroundings— on the floor, on the footpath, etc., to draw conclusion that all shapes do not tile
- conduct role play of seller and buyer in selling/buying situation where lots of addition and subtraction of amounts using play money may be done
- measure the length of objects in their surroundings by using scale/ tape. Students may be encouraged to estimate the length first and then verify it by actual measurement
- use simple balance to compare and find weight of common objects in terms of non-standard units like small stones, packets of objects, etc.
- measure capacities of different containers and describe their experiences of doing so, e.g., finding how many jugs can fill a bucket or how many glasses can be filled from one jug full of water
- use of vocabulary about time and calendar through discussions/ story telling
- attempt to read a clock and calendar
- observe patterns both geometrical and numerical and discuss them. (Presentation by the group may be done in front of the whole class)
- collect and record data in their own way and use pictograph to represent it. for example, flower of different colours in the school garden or the number of boys and girls present a class
- to interpret pictographs from magazines and newspaper which can be displayed in the classroom.
- reads the time correctly to the hour using a clock/watch
- extends patterns in simple shapes and numbers
- records data using tally marks, represents pictorially and draws conclusions.

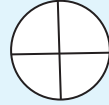


Class IV (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes																					
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to —</p> <ul style="list-style-type: none"> explore and write multiplication facts through various ways like skip counting, extending patterns, etc. For example, for developing multiplication table of 3, children could use either skip counting or repetitive addition or pattern as shown below: <table border="1" style="margin: 10px auto; border-collapse: collapse; text-align: center;"> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td></tr> <tr><td>7</td><td>8</td><td>9</td></tr> <tr><td>10</td><td>11</td><td>12</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> </table> <ul style="list-style-type: none"> expand the two digit number and multiply, e.g., 23 multiplied by 6 could be solved as follows: $23 \times 6 = (20+3) \times 6 = 20 \times 6 + 3 \times 6$ $120 + 18 = 138$ solve and create daily life problems using multiplication like, if a pen costs Rs. 35 what will be the cost of 7 pens? discuss and evolve standard algorithm for multiplication. make groups for division, e.g., $24 \div 3$ means <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: center;">i.e. to find how many groups of 3 can be there in 24 or how many 3's make 24?</p> <ul style="list-style-type: none"> create contextual questions based on mathematical statements, e.g., the statement $25 - 10 = 15$ may trigger different questions from different students. A student may create: "I had 25 apples. Ten were eaten. How many apples are still left?" create contextual problem through group activity such as dividing the class in two groups where one group solves the problem given by the other group by using different operations and the vice-versa. 	1	2	3	4	5	6	7	8	9	10	11	12	-	-	-	-	-	-	-	-	-	<p>The learner —</p> <ul style="list-style-type: none"> applies operations of numbers in daily life <ul style="list-style-type: none"> multiplies 2 and 3 digit numbers divides a number by another number using different methods like – pictorially (by drawing dots), equal grouping or repeated subtraction and by using inter-relationship between division and multiplication creates and solves simple real life situations/ problems including money, length, mass and capacity by using the four operations works with fractions <ul style="list-style-type: none"> identifies half, one-fourth, three-fourths of a whole in a given picture by paper folding and also in a collection of objects. represents the fractions as half, one-fourth and three-fourths by using numbers/ numerals shows the equivalence of a fraction with other fractions acquires understanding about shapes around her/him <ul style="list-style-type: none"> identifies the centre, radius and diameter of the circle finds out shapes that can be used for tiling makes cube/ cuboids using the given nets shows through paper folding/ paper cutting, ink blots, etc. the concept of symmetry by reflection draws top view, front view and side view of simple objects explores the area and perimeter of simple geometrical shapes (triangle, rectangle, square) in terms of given shape as a unit. For example, the number of books that can completely fill the top of a table. converts metre into centimetre and vice-versa estimates the length of an object/distance between two locations, weight of various objects, volume of liquid, etc., and verifies them by actual measurement
1	2	3																				
4	5	6																				
7	8	9																				
10	11	12																				
-	-	-																				
-	-	-																				
-	-	-																				



- to discuss and corelate fractional numbers like half, one fourth, three fourths with daily life
 - represent the fractional numbers through activities related to pictures/paper folding
- For example –
shade half the picture



Shaded part of which of the following pictures do not represent one fourth ($\frac{1}{4}$)

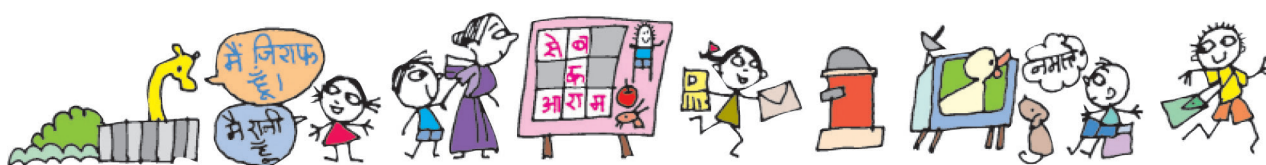


- draw circles with various lengths of radius, compasses and explores various designs with the shape.
- discuss observation on tiling (of different shapes) which they see in their homes/ on footpaths / floors of various buildings
- make their own tiles and verify whether the tiles they created tessellate or not
- look at various objects in the classroom from different viewpoints and make a deep drawing of the view. For example, a glass may look differently from the front. Questions like, 'But how it would look like from the top?' Or 'how it would look like from below?' may be raised
- convert rupees into *paisa*, e.g., how may 50 *paisa* coins you will get in exchange of 20 rupees
- make bills so that the students while making bills will use the four operations of addition/ subtraction/ multiplication/ division
- estimate the length of an object/ distance first and then verify them by actually measuring them. For example, estimating the length of their bed or distance between the school gate and the classroom and verifying it by measuring them

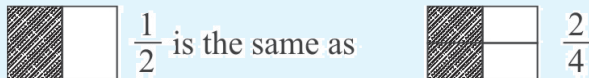
- solves problem involving daily life situations related to length, distance, weight, volume and time involving four basic arithmetic operations
- reads clock time in hour and minutes and expresses the time in a.m. and p.m.
- relates to 24 hr clock with respect to 12 hr clock
- calculates time intervals/ duration of familiar daily life events by using forward or backward counting/ addition and subtraction
- identifies the pattern in multiplication and division (up to multiple of 9)
- observes, identifies and extends geometrical patterns based on symmetry
- represents the collected information in tables and bar graphs and draws inferences from these



- make a balance and weigh things with standard weights. In case standard weights are not available, packages with standard weights may be used like packets of $\frac{1}{2}$ kg dal, 200 gm pack of salt, 100 gm pack of biscuits
- innovate use of weights like using two 250 gm packets instead of 500gm packet (or by using stones of equivalent weights, etc.)
- make their own measuring vessel to measure capacities of other vessels. For example, a bottle may have capacity for 200 ml and can be used as a measurement unit to know the amount of water in a jug or in a container
- observe and study the calendar and come up with the number of weeks in a month/ in a year. Let children explore the pattern in the number of days in each month and how days are associated with dates in a month, etc.
- utilise their experiences inside/outside the class having exposure to telling time/ reading clock in hours and minutes, alongwith peers
- discover the time lapsed in an event by counting forward or using subtraction/ addition
- explore patterns/ designs in their environment (using shapes and numbers) and make such patterns and extend them
- collect information and draw meaningful results in their daily life. Using these experiences, the children may be involved in activities focusing on data handling
- read data/bar graphs, etc., from newspapers/magazines and interpret them.



Class V (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to —</p> <ul style="list-style-type: none"> • discuss on contexts/situations in which a need arises to go beyond the number 1000 so that extension of number system occurs naturally. For example number of grams in 10 kg, number of metres in 20 km, etc. • represents numbers beyond 1000 (up to 100000) using place value system, like extend learning of numbers beyond 9 thousand, how to write number one more than 9999 • operate (addition and subtractions) large numbers using standard algorithm. This may be identified as extension of algorithm for one more place • use a variety of ways to divide numbers like equal distribution and inverse process of multiplication • estimate the results of number operation through approximations and then verifies it • develop the idea of multiples of a number through its multiplication facts, skip counting on a number line and number grid • develop the concept of factors through division of numbers and multiples • discuss and use contexts/ situations from daily life in activities to develop understanding about fractional part of the group like, how many bananas are there in half a dozen bananas? • compares fractions through various ways like paper folding, shading of diagram etc. • develop the idea of equivalence of fractions through various activities. For example, by paper folding and shading: <div style="text-align: center;">  </div> <ul style="list-style-type: none"> • understand the idea of decimal fractions (1/10 th and 1/100 th) • develop earlier understanding of angles and to describe it. 	<p>The learner —</p> <ul style="list-style-type: none"> • works with large numbers <ul style="list-style-type: none"> – reads and writes numbers bigger than 1000 being used in her/his surroundings – performs four basic arithmetic operations on numbers beyond 1000 by understanding of place value of numbers – divides a given number by another number using standard algorithms – estimates sum, difference, product and quotient of numbers and verifies the same using different strategies like using standard algorithms or breaking a number and then using operation. For example, to divide 9450 by 25, divide 9000 by 25, 400 by 25, and finally 50 by 25 and gets the answer by adding all these quotients. • acquires understanding about fractions <ul style="list-style-type: none"> – finds the number corresponding to part of a collection – identifies and forms equivalent fractions of a given fraction – expresses a given fraction $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$ in decimal notation and vice-versa. For example, in using units of length and money– half of Rs. 10 is Rs.5 – converts fractions into decimals and vice versa • explores idea of angles and shapes <ul style="list-style-type: none"> – classifies angles into right angle, acute angle, obtuse angle and represents the same by drawing and tracing – identifies 2D shapes from the immediate environment that have rotation and reflection symmetry like alphabet and shapes – makes cube, cylinder and cone using nets designed for this purpose • relates different commonly used larger and smaller units of length, weight and volume and converts larger units to smaller units and vice versa • estimates the volume of a solid body in known units like volume of a bucket is about 20 times that of a mug



- observe angles in their surroundings and compare their measures. For example, whether the angle is smaller, bigger or equal to the corner of a book which is a right angle; further, classify the angles
- introduce protractor as a tool for measuring angles and use it to measure and draw angles
- explore symmetry by using paper folding/ paper cutting
- explore shapes so that they can find out that some shapes look the same only after one complete rotation/ part of a rotation
- plan their shopping— to make estimates of money (in different denominations) and the balance money one would get
- conducts role play of shopkeepers/ buyers in which students create bills
- measure length of different objects using a tape/ metre scale.
- appreciates the need of converting bigger units to smaller units
- discuss experiences on units of capacity printed on water bottle, soft drink pack, etc.
- fill a given space by using different solid shapes, cubes, cuboids, prisms, spheres, etc. and encourage students to decide which solid shape is more appropriate
- measure volume by counting the number of unit cubes that can fill a given space
- explore patterns in numbers while doing various operations and to generalise them as patterns in square numbers

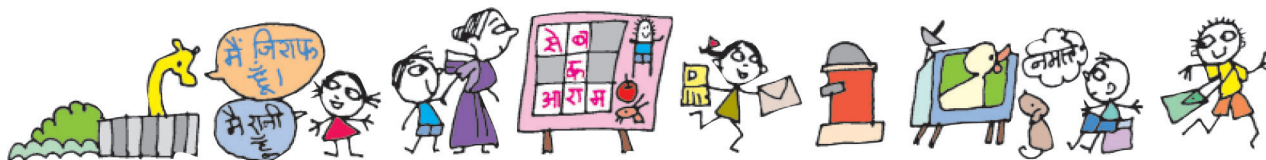


- Triangular number as shown below also forms a pattern



- collect information and display it in a pictorial form. For example, heights of students from their class and represent it pictorially
- collect and discuss various diagrams/ bar charts from the newspapers/ magazines may be in the class.

- applies the four fundamental arithmetic operations in solving problems involving money, length, mass, capacity and time intervals
- identifies the pattern in triangular number and square number
- collects data related to various daily life situations, represents it in tabular form and as bar graphs and interprets it.



LEARNING OUTCOMES IN MATHEMATICS

UPPER PRIMARY STAGE

Curricular Expectations

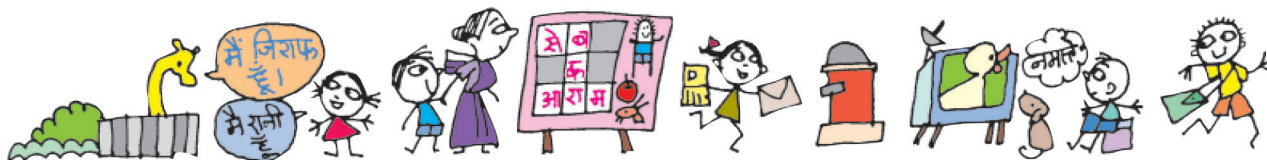
Children are expected to:

- move from concrete ideas of numbers to number sense
- sees relationships between numbers and looks for patterns in relationship
- understand and applies concept related to variables, expressions, equations, identities, etc.
- use arithmetic and algebra to solve real life problems and pose meaningful problems
- develop aesthetic sense by discovering symmetries in shapes like triangles, circles and quadrilaterals
- identifies space as region enclosed within boundaries of a shape
- develop spatial understandings in terms of perimeter, area and volume and uses them to solve day-to-day life problems
- learn to provide reasoning and convincing arguments to justify her/his own conclusions in mathematical context
- collect, represent (graphically and in tables) and interpret data/information from her/his life experiences.



Class VI (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to —</p> <ul style="list-style-type: none"> encounter situations having numbers up to 8 digits, e.g., cost of property, total population of different towns, etc. compare numbers through situations like cost of two houses, number of spectators, money transactions, etc. classify numbers on the basis of their properties like even, odd, etc. observe patterns that lead to divisibility by 2,3,4,5,6,8,10 and 11. create number patterns through which HCF and LCM can be discussed explore daily life situations to involve the use of HCF and LCM create and discuss daily life situations involving the use of negative numbers observe situations that require the representation by fractions and decimals use different contexts in mathematics to appreciate the necessity of representing unknowns by variables (alphabet) explore and generalise the need of using variables alphabets describe situations involving the need for comparing quantities by taking ratio discuss and solves word problems that use ratios and unitary method explore various shapes through concrete models and pictures of different geometrical shapes like triangles and quadrilaterals, etc. identify various geometrical figures and observe their characteristics in and outside the classroom environment either individually or in groups make different shapes with the help of available materials like sticks, paper cutting, etc. observe various models and nets of 3-Dimensional (3-D) shapes like cuboid, cylinder, etc. and discuss about the elements of 3-D figures such as faces, edges and vertices 	<p>The learner —</p> <ul style="list-style-type: none"> solves problems involving large numbers by applying appropriate operations (addition, subtraction, multiplication and division) recognises and appreciates (through patterns) the broad classification of numbers as even, odd, prime, co-prime, etc. applies HCF or LCM in a particular situation solves problem involving addition and subtraction of integers. uses fractions and decimals in different situations which involve money, length, temperature etc. For example, $7\frac{1}{2}$ metres of cloth. distance between two places is 112.5 km etc. solves problems on daily life situations involving addition and subtraction of fractions / decimals uses variable with different operations to generalise a given situation. e.g., Perimeter of a rectangle with sides x units and 3 units is $2(x+3)$ units compares quantities using ratios in different situations. e.g., the ratio of girls to boys in a particular class in 3:2 uses unitary method in solving various word problems. For example, if the cost of a dozen notebooks is given she finds the cost of 7 notebooks by first finding the cost of 1 notebook describes geometrical ideas like line, line segment, open and closed figures, angle, triangle, quadrilateral, circle, etc., with the help of examples in surroundings demonstrates an understanding of angles by <ul style="list-style-type: none"> identifying examples of angles in the surroundings classifying angles according to their measure estimating the measure of angles using 45°, 90°, and 180° as reference angles demonstrates an understanding of line symmetry by <ul style="list-style-type: none"> identifying symmetrical 2-Dimensional (2-D) shapes which are symmetrical along one or more lines





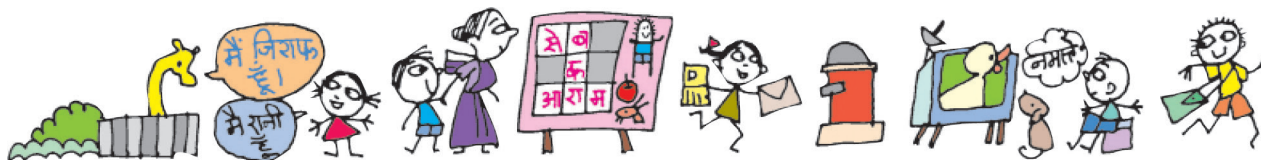
- share the concept of angles through some examples like opening the door, opening the pencil box, etc. Students can be asked to give more such examples from the surroundings
- classify angles based on the amount of rotation

- creating symmetrical 2-D shapes
- classifies triangles into different groups/types on the basis of their angles and sides. For example- scalene, isosceles or equilateral on the basis of sides, etc.
- classifies quadrilaterals into different groups/types on the basis of their sides/angles
- identifies various (3-D) objects like sphere, cube, cuboid, cylinder, cone from the surroundings
- describes and provides examples of edges, vertices and faces of 3-D objects
- finds out the perimeter and area of rectangular objects in the surroundings like floor of the class room, surfaces of a chalk box etc.
- arranges given/collected information such as expenditure on different items in a family in the last six months, in the form of table, pictograph and bar graph and interprets them.



Class VII (Mathematics)

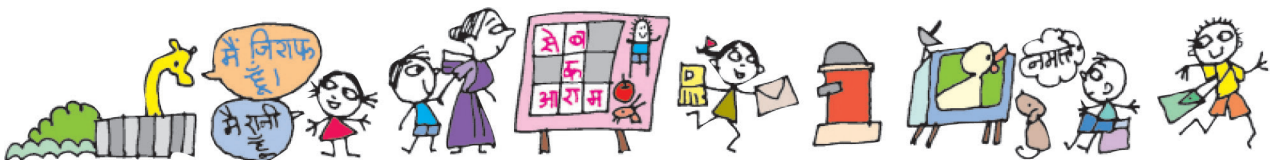
Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to—</p> <ul style="list-style-type: none"> provide contexts for exploring the rules of multiplication and division of integers. This can be done through number line or number patterns. <p>For example :</p> $3 \times 2 = 6$ $3 \times 1 = 3$ $3 \times 0 = 0$ $3 \times (-1) = -3$ $3 \times (-2) = -6$ <p>So $3 \times (-3) = -9$</p> <p>means a positive integer multiplied by a negative integer given a negative integer</p> <p>For example:</p> <p>(a) $\frac{1}{4} \times \frac{1}{2}$ is $\frac{1}{4}$ of $\frac{1}{2}$ is $\frac{1}{8}$</p> <p>means number of $\frac{1}{4}$ in $\frac{1}{2}$ are two</p>  <p>(b) $\frac{1}{2} \div \frac{1}{4}$</p>  <ul style="list-style-type: none"> explore the multiplication/ division of fractions/decimals through pictures/paper folding activities /daily life examples. discuss the situations that require the use of fractional numbers in opposite direction, such as moving $10\frac{1}{2}$ m to the right of a tree and $15\frac{2}{3}$ m to its left etc. involve children in exploring how repeated multiplication of numbers can be expressed in short form. For example $2 \times 2 \times 2 \times 2 \times 2 = 2^5$ can be expressed as 2^6. 	<p>The learner—</p> <ul style="list-style-type: none"> multiplies/divides two integers interprets the division and multiplication of fractions. for example interprets $\frac{2}{3} \times \frac{4}{5}$ as $\frac{2}{3}$ of $\frac{4}{5}$. Also $\frac{1}{2} \div \frac{1}{4}$ is interpreted as how many $\frac{1}{4}$ make $\frac{1}{2}$? uses algorithms to multiply and divide fractions/decimals. solves problems related to daily life situations involving rational numbers uses exponential form of numbers to simplify problems involving multiplication and division of large numbers. represents daily life situations in the form of a simple equation and solves it adds/subtracts algebraic expressions distinguishes quantities that are in proportion. For example, tells that 15, 45, 40, 120 are in proportion as $\frac{15}{45}$ is the same as $\frac{40}{120}$ solves problems related to conversion of percentage to fraction and decimal and vice versa calculates profit/loss percent and rate percent in simple interest classifies pairs of angles based on their properties as linear, supplementary, complementary, adjacent and vertically opposite and finds value of the one when the other is given. verifies the properties of various pairs of angles formed when a transversal cuts two lines finds unknown angle of a triangle when its two angles are known explains congruency of triangles on the basis of the information given about them like (SSS, SAS, ASA, RHS) using ruler and a pair of compasses constructs, a line parallel to a given line from a point outside it and triangles



- explore the possible combinations of variables and constants using different operations to form algebraic expressions in various contexts.
- provide situations from daily life that lead to setting up of equations and choosing the appropriate value of the variable that equate both sides.
- conduct activity of adding /subtracting number of objects of same category from daily life. For example number of notebooks obtained when 3 notebooks are added to a group of 5 notebooks.
- evolve the understanding of the concepts of ratios and percentage (equality of ratio.)
- provide daily life situations based on profit/loss and simple interest that show the use of percentage
- explore different examples from daily life in which pair of angles are involved with a common vertex, e.g., Scissors, Road Junction, Letter X, T, etc
- verify the properties of various pairs of angles by drawing diagram (One group can give measure of one angle, the other group needs to give the measure of other angle.)
- visualise the relationship between various pairs of angles when a transversal cuts two lines (parallel and non-parallel), angles of triangle and relationship among its sides through diagrams and upper primary mathematics kit (developed by NCERT)
- draw different types of triangles, ask them to measure angles of all triangles, and verify
- explore exterior angle property of triangles; and Pythagoras theorem
- identify symmetrical figures from their environment and which shows rotational symmetry
- visualise the symmetry through paper folding activities
- establish congruence criterion and later on verify the property by superimposing one above the other
- demonstrate the construction of a line parallel to the given line from a point outside it through students active participation
- finds out approximate area of closed shapes by using unit square grid/ graph sheet
- calculates areas of the regions enclosed in a rectangle and a square
- finds various representative values for simple data from her/his daily life contexts like mean, median and mode
- recognises variability in real life situation such as, variations in the height of students in her class and uncertainty in happening of events like throwing a coin
- interprets data using bar graph such as consumption of electricity is more in winters than summer, runs scored by a team in first 10 overs etc.



- construct the simple triangle by using ruler and compasses
- cut out different closed figures drawn on hard boards/ thick papers. trace the figures in the given graph sheets
- count the exact number of square units occupied by the traced figure (Complete, Half, etc). and find out the approximate area of these figures
- through discussion motivate them to arrive at the formula for area of a rectangle/square
- find a representative value of data i.e. mean, mode or median of ungrouped data. Encourage them to arrange it in a tabular form and represent it by bar graphs
- draw inferences for future events from the existing data
- discuss the situations where the term 'chance' can be used, for example, what are the chances of winning today as chances of getting 6 while rolling a dice
- sum of two sides of a triangle is greater than the third side.



Class VIII (Mathematics)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to —</p> <ul style="list-style-type: none"> • explore examples of rational numbers with all the operations and explore patterns in these operations • use generalised form of numbers upto 3 digits and uses her understanding of algebra to derive the divisibility rules for 2, 3, 4 done earlier by observing patterns on them • explore patterns in square numbers, square roots, cubes and cube roots of numbers and form rules for exponents as integer • observe situations that lead to simple equations and solve them using suitable processes • multiply two algebraic expressions and different polynomials based on previous knowledge of distributive property of numbers and generalise various algebraic identities using concrete examples • factorise algebraic expressions using relevant activities based on previous knowledge of factorising two numbers • observe contexts that involve the use of percentages like discount, profit & loss, VAT, simple and compound interest, etc. • generalise the formula of compound interests through repeated use of simple interest • observe situations where one quantity depends on the other. the quantities increase together, or in which while one increases the other decreases. For example, as the speed of a vehicle increases the time taken by it to cover the distance decreases. • measure the angles and sides of different quadrilaterals and identify patterns in the relationship among them, make hypothesis on the basis of generalisation of the patterns and later on verify through examples • verify the properties of parallelograms and apply reasoning by doing activities such as constructing parallelograms, drawing their diagonals and measuring their sides and angles 	<p>The learner —</p> <ul style="list-style-type: none"> • generalises properties of addition, subtraction, multiplication and division of rational numbers through patterns • finds out as many rational numbers as possible between two given rational numbers. • proves divisibility rules of 2, 3, 4, 5, 6, 9 and 11 • finds squares, cubes and square roots and cube roots of numbers using different methods. • solves problems with integral exponents. • solves puzzles and daily life problems using variables. • multiplies algebraic expressions. • e.g expands $(2x-5)(3x+7)$. • uses various algebraic identities in solving problems of daily life • applies the concept of per cent in profit and loss situation in finding discount, VAT and compound interest. e.g., calculates discount per cent when marked price and actual discount are given or finds profit per cent when cost price and profit in a transaction are given. • Solves problems based on direct and inverse proportions • Solves problems related to angles of a quadrilateral using angle sum property • verifies properties of parallelograms and establishes the relationship between them through reasoning. • represents 3D shapes on a plane surface such as sheet of paper, black board etc. • verifies Euler's relation through pattern • constructs different quadrilaterals using compasses and straight edge. • estimates the area of shapes like trapezium and other polygons by using square grid/ graph sheet and verifies using formulas. • finds the area of a polygon. • finds surface area and volume of cuboidal and cylindrical object.

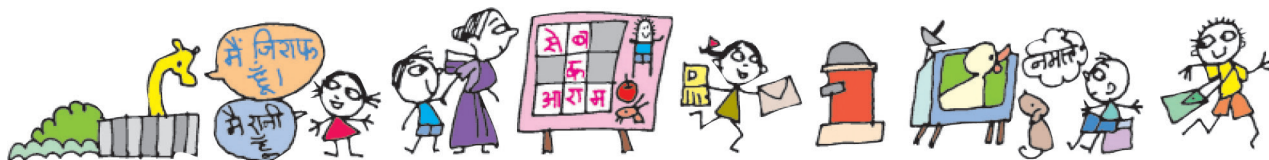


- express/represent a 3-D shape into its 2-D form from their daily life like, drawing a box on a plane surface, showing bottles on paper, board or wall etc.
- make nets of various shapes like cuboids, cubes, pyramids, prisms, etc. and from nets make the shapes and establish relationship among vertices, edges and surfaces
- demonstrate the construction of various quadrilaterals using geometric kit
- sketch the figure of trapezium and other polygons in the given graph paper and asked student to estimate their areas using counting of unit square
- derive the formula for calculating area of trapezium using the areas of triangle and rectangle (square)
- identify that surfaces of various 3-D objects like cubes, cuboids and cylinder
- derive formulae for surface area of cubes and cuboids using the formulae for areas of rectangles, squares and circles
- demonstrate to find volume of a given cube and cuboid using unit cubes
- collect data, organise it into groups and represent it into bar graphs/ pie chart
- conduct activities related to throwing a large number of identical dice/coins together and aggregating the result of the throws to get a large number of individual events and make assumptions for future events on the basis of the above data.
- draws and interprets bar charts and pie charts.
- makes hypotheses on chances of future events on the basis of its earlier occurrences or available data like , after repeated throws of dice and coins

For Children with Special Needs (Mathematics)

To overcome difficulties of access with respect to learning mathematics, some pupils may require tactile, and others specialised, equipment for work related to shape, geometry, calculations, etc. Some may require simpler language or more pictures. Others may need help in interpreting data in graphs, tables, or bar charts. There may be children who may need help in interpreting oral directions or while making mental calculations. Use of ICT may be required to overcome difficulties in quantitative and abstract thinking.

Some specific needs of children with different disabilities are given below which may be taken care of to help them learn with their peers and accomplish the desired learning outcomes.



For Visually Impaired Children

- Development of spatial concepts (concepts related to space) and understanding the relationships between spatial concepts
- Understanding three-dimensional objects transformed into two-dimensional forms
- Understanding special characters (symbols) used in Mathematics
- Difficulty in audio recording of mathematical text, for example, equations etc.
- Difficulty in transcribing and reading mathematical text in Braille because of spatial arrangement and colour codes
- Learning of Nemeth or any other Mathematical Braille Code

For Hearing Impaired children

- Delay in linguistic growth, leading to lack of general vocabulary and technical vocabulary of Mathematics (words like reciprocal, linear etc.)
- Understanding the wordiness (use of a number of words to explain meaning or making a point) of mathematical problems
- Distinguishing words with multiple meanings like interest, table, credit, angle, rate, volume, power, point
- Distinguishing mathematical words while student is lip/speech reading (tens and tenths, sixty and sixteen)
- Limited use of cognitive strategies to select the relevant information and approaches necessary for solving problems.
- For Children with Cognitive Impairments, Intellectual Disability
- Sequencing, step-wise problem solving and difficulty in place value
- Mathematical calculations (computations), number reversals, copying problems etc Confusion in operational symbols, such as + for \times , and difficulty in recalling sequence of operations
- Identifying different shapes in geometry and directionality
- Abstract concepts like in Algebra and integers, etc.
- Comprehension of word problems.



LEARNING OUTCOMES IN ENVIRONMENTAL STUDIES

PRIMARY STAGE

Introduction

Environmental Studies (EVS) at the primary stage envisages exposing children to the real situations in their surroundings to help them connect, be aware of, appreciate and be sensitised towards the prevailing environmental issues (natural, physical, social and cultural). The NCF-2005 recommends an integrated and thematic approach towards its teaching learning at the entire primary stage where, in classes III to V, it is introduced as a separate curricular area and in I and II, the related concerns are integrated with language and mathematics. Beginning with the child's immediate surroundings (including natural, social, physical and cultural settings) related to self, home, school and family in the early grades and gradually moving on to the wider environment (neighbourhood and community at large), EVS not only helps children to get acquainted with their own environment but it also strengthens their bond with it. Creating learning situations in the context of children is very crucial to learning EVS. Efforts need to be made to avoid giving direct information, definitions and descriptions and instead create situations for children to construct their own knowledge by interacting first hand with their surroundings and with other children, elders and significant others. During this process, they would access various sources of knowledge besides the textbook and explore various learning sites besides the classroom. Real world exposure would lead to opportunities for them to encounter various social issues (such as those of gender bias, marginalisation, challenges of the differently abled (including those of the elderly and the sick) and natural concerns (such as those of protection, preservation, conservation of natural resources). Care may be taken to ensure that besides resource material, the classroom environment and the pedagogical processes are inclusive i.e. they cater to the diversity of learners in terms of their abilities, cognitive development, pace, style, etc. It is important to acknowledge and give primacy to children's experiences to help them connect these with the school knowledge while ensuring their active participation. Hence, the learning situations need to include a variety in approaches, strategies and resources to ensure that each learner (including the differently abled and the disadvantaged learners) gets opportunity to observe, express, discuss, question, critically think, improvise and analyse, i.e.

gets engaged in various processes of learning involving use of multiple senses in individual and group set-ups.

In order to have a comprehensive view of a child's development and map his/her learning progress in EVS, as per its curricular expectations, a set of learning outcomes in EVS for each class have been spelt out. These require using pedagogical processes to create age-appropriate and contextual learning situations and considering learning needs and learning styles of the learners to facilitate teachers/elders to explore their existing ideas and build further on them to enhance their knowledge, skills, values, interests and dispositions. The suggested pedagogical processes given class-wise, in the table below, provide different stakeholders especially teachers some clues for the learning situations. These can help them plan and design learning tasks/activities and also assess children for their learning progress in an inclusive classroom.

Curricular Expectations

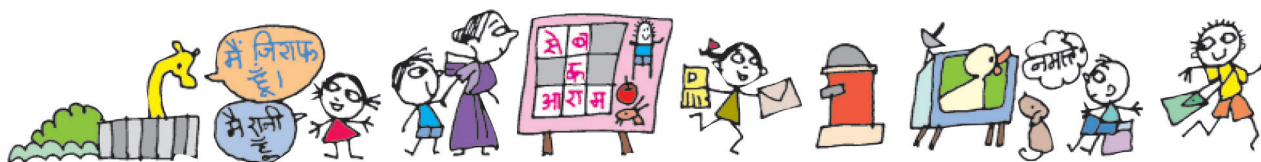
As per the EVS curriculum, children at the Primary Stage are expected to:

- acquire awareness about immediate/wider surroundings through lived experiences on various themes related to daily life, e.g., family, plants, animals, food, water, travel, and shelter etc.
- nurture natural curiosity and creativity for the immediate surroundings.
- develop various processes/skills, e.g., observation, discussion, explanation, experimentation, logical reasoning, through interaction with immediate surroundings.
- develop sensitivity for the natural, physical and human resources in the immediate environment.
- point out and raise issues related to equality, justice and respect for human dignity and rights.



Class III (EVS)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/ individually and encouraged to —</p> <ul style="list-style-type: none"> observe and explore the immediate surroundings, i.e., home, school and neighbourhood for different objects/plants/ animals/birds for their concrete/ simple observable physical features (diversity, appearance, movement, places of living/ found, habits, needs, behaviour etc.) observe, explore their home/family for the people whom they live with, what works they do, the relations and their physical features and habits and share the experiences in different ways explore the neighbourhood for the means of transport, communication and what works people do observe their home/school kitchen for food items, vessels, stoves, fuels and cooking processes discuss with elders and find out from where we/birds/animals get water, food (plants/ animals, which part of the plant we eat etc.), who works in the kitchen, who eats what, who eats last visit different places in the neighborhood, e.g., market to observe the process of buying/selling, journey of a letter from post office to home, local water bodies etc. ask and frame questions and respond to the peers and elders without any fear or hesitation share their experiences/observations through drawing/ symbols /tracing / gestures/ verbally in a few words /simple sentences in their own language compare objects/entities based on differences/ similarities for observable features and sort them into different categories 	<p>The learner —</p> <ul style="list-style-type: none"> identifies simple observable features (e.g., shape, colour, texture, aroma) of leaves, trunk and bark of plants in immediate surroundings identifies simple features (e.g., movement, at places found/kept, eating habits, sounds) of animals and birds) in the immediate surroundings identifies relationships with and among family members identifies objects, signs (vessels, stoves, transport, means of communication, transport, signboards etc.); places (types of houses/shelters, bus stand, petrol pump etc.) activities (works people do, cooking processes, etc.) at home/school/ neighbourhood describes need of food for people of different age groups; animals and birds, availability of food and water and use of water at home and surroundings describes roles of family members, family influences (traits/ features /habits / practices), need for living together, through oral/ written/other ways groups objects, birds, animals, features, activities according to differences/ similarities using different senses. (e.g., appearance/place of living/ food/ movement/ likes-dislikes/ any other features) using different senses.

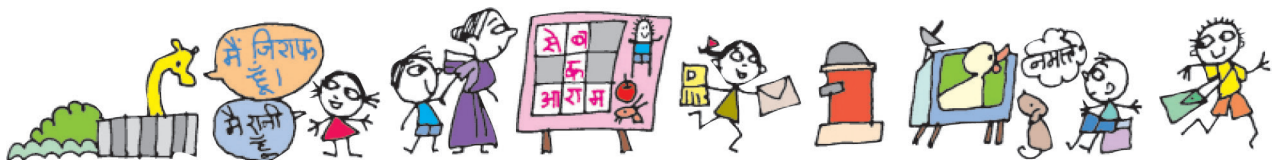


- discuss with the parents/guardians/grandparents/elders in the neighbourhood and compare their lives in past with that of now for the things of daily use such as clothes, vessels, works done by people around, games
- collect and arrange the objects such as, pebbles, beads, fallen leaves, feathers, pictures, etc., of their finds from their surroundings and arrange in an innovative manner, e.g., heaps, pouches and packets
- critically think to guess/estimate and predict about the happenings, situations, events and the possible ways to check, verify, test them., For example, which directions (left/right/front/back) to be followed to reach a nearby object or place; which vessel (of same volume) contains more water; how many spoons of water to fill a mug or a bucket etc.
- perform simple activities and experiments to observe, smell, taste, feel, hear using different senses as per their abilities to identify, classify, differentiate between objects, features, entities etc.
- collect observations and experiences on the experiments and activities and shares that orally /gestures /sketches /tables /writing in simple sentences
- manipulate local and waste material, fallen dry leaves/flowers, clay, fabrics, pebbles, colours to create or improvise drawings, models, designs, collage etc. For example using clay to make pots/vessels, animals, birds, vehicles, furniture from empty matchboxes, cardboard, etc.
- share experiences of their relationships with pets and domestic animals or other birds and animals in surroundings
- participate actively and undertake initiatives of care, share empathy, leadership by working together in groups, e.g., in different indoor/outdoor/local/contemporary activities and games, carry out projects such as taking care of a plant(s), feed birds/animals, things around them.

- differentiates between objects and activities of present and past (at time of the elders). (e.g., clothes /vessels /games played/ work done by people)
- identifies directions, location of objects/ places in simple maps (of home/ classroom/ school) using signs/symbols/verbally
- guesses properties, estimates quantities; of materials/activities in daily life and verifies using symbols/non-standard units (hand spans, spoon/mugs, etc.)
- records observations, experiences, information on objects/activities/places visited in different ways and predicts patterns (e.g., shapes of moon, seasons)
- creates drawings, designs, motifs, models, top, front, side views of objects, simple maps (of classroom, sections of home/ school, etc.) and slogans, poems, etc.
- observes rules in games (local, indoor, outdoor) and other collective tasks
- voices opinion on good/bad touch; stereotypes for tasks/play/food in family w.r.t gender, misuse/wastage of food and water in family and school
- shows sensitivity for plants, animals, the elderly, differently abled and diverse family set ups in surroundings. (For the diversity in appearance, abilities, choices – likes/ dislikes, and access to basic needs such as food, shelter, etc.)



- question, discuss, critically think and reflect on their experiences related to situations at home, school, neighbourhood for stereotypes or discrimination, such as, roles of male/female members, access to food, health, going to school, needs of elders and the differently abled etc.
- explore and read pictures, posters, signboards, books, audio-videos, tactile/raised material/newspaper clippings, stories/poems, web resources, documentaries, library and use other resources besides textbook.



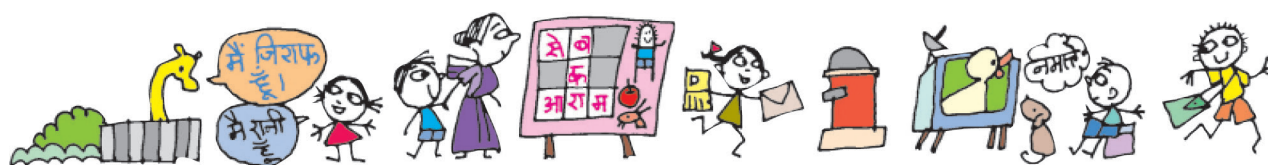
Class IV (EVS)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learners may be provided opportunities in pairs /groups / individually and encouraged to —</p> <ul style="list-style-type: none"> observe and explore the immediate surroundings, i.e., home, school and neighborhood for different objects/flowers/plants/animals/birds for their simple observable physical features (diversity, appearance, movement, places of living, food habits, needs, nesting, group behaviour, etc.) ask questions and discuss with family members/elders as to why some family members stay together and others are away, interact with relatives, friends etc. who stay at far off places, about the houses/ transport and life in their place of residence. visit community/ home kitchen/ <i>mandi</i>/ museum/ wildlife sanctuaries/ farms/ natural sources of water/ bridges/ construction sites/ local industries/ distant relatives, friends/ places famous for making special things such as paintings, carpets, handicrafts, etc. interact with people (vegetable sellers, flower sellers, beekeepers, gardeners, farmers, drivers, health and defense personnel, etc.) and share experiences about their work, their skills and tools used by them discuss with elders, the situations about changes in family with time, roles of different family members, share their experiences and views on stereotypes/ discrimination /unfair treatment to people/ animals/birds/plants in their home/school /neighbourhood ask and frame questions and reflect on experiences without any fear or hesitation share their experiences and observations through drawing/symbols/tracing/ gestures/ verbally and writing in some sentences and para in simple language compare objects and entities based on differences or similarities in the observable features and sorts them into different categories 	<p>The learner —</p> <ul style="list-style-type: none"> identifies simple features (e.g., shape, colour, aroma, where they grow/any other) of flowers, roots and fruits in immediate surroundings. identifies different features (beaks/teeth, claws, ears, hair, nests/shelters, etc.) of birds and animals. identifies relationship with and among family members in extended family. explains the herd/group behaviour in animals (ants, bees, elephants), birds (building nests); changes in family (e.g., due to birth, marriage, transfer, etc.) describes different skilled work (farming, construction, art/craft, etc.); their inheritance (from elders) and training (role of institutions) in daily life explains the process of producing and procuring daily needs (e.g., food, water, clothes) i.e., from source to home. (e.g., crops from field to <i>mandi</i> and home, water from local source and ways of its purification at home/ neighbourhood) differentiates between objects and activities of past and present. (e.g., transport, currency, houses, materials, tools, skills-farming, construction, etc.) groups the animals, birds, plants, objects, waste material for observable features. (e.g., on appearance (ears, hair, beaks, teeth, texture of skin/surface), instincts (domestic/wild, fruit/ vegetable/ pulses/ spices and their shelf life) uses (edibility, medicinal, decoration, any other, reuse), traits (smell-taste, likes, etc.) guesses (properties, conditions of phenomena), estimates spatial quantities (distance, weight, time, duration) in standard/local units (<i>kilo, gaz, pav</i> etc.) and verifies using simple tools/set ups to establish relation between cause and effect. (e.g., evaporation, condensation, dissolution, absorption; for places- near/ far, objects- size and growth; shelf life of flower, fruit, vegetables)



- discuss with the parents/guardians/grandparents/elders in the neighbourhood and compare the life style of past and present (clothes, vessels, nature of work, games); inclusion of children with special needs
- collect objects and material from their surroundings such as fallen flowers, roots, spices, seeds, pulses, feathers, newspapers, magazine articles, advertisements, pictures, coins, stamps and arrange them, etc. in an innovative manner
- perform simple activities and experiments to observe/smell/taste/feel/hear using different senses as per their abilities e.g., to test solubility of different substances in water, separate salt and sugar from water, and observe how fast a piece of wet cloth dries up (in sun, in a room, rolled, flattened, with/without fan) blow hot, blow cold
- observe and share experiences of the phenomena, happenings, situations in daily life such as how root, flowers grow, lifting of weight with/without a pulley etc. and use ways to check/verify/test the observations through simple experiments and activities
- read train/ bus tickets and Time Table, currency notes, directions to locate places on the map, signboards
- manipulate local /waste material to create/improvise patterns, drawings, models, motifs, collage, poem/story/slogans using variety of material. For example, using clay to make pots/vessels, animals birds, vehicles, making train, furniture from empty matchboxes, cardboard, waste material etc.
- participate in different cultural/national/environmental festivals/occasions organised in/at home/school/community, e.g., morning or special assembly/ exhibition/ Diwali, Onam, Earth Day, Eid etc. in events of celebrations, dance, drama, theatre, creative writing etc. (e.g., *diya/rangoli*/kite making/ models of buildings/bridges etc. and sharing experiences through stories, poems, slogans, reports about the events narration/creative writing (poem/story) or any other creative tasks

- records her observations /experiences/ information for objects, activities, phenomena, places visited (*mela*, festival, historical place) in different ways and predicts patterns in activities/phenomena.
- identifies signs, location of objects/places and guides for the directions w.r.t a landmark in school/neighbourhood using maps etc.
- uses the information on signboards, posters, currency (notes/coins), railway ticket/time table.
- creates collage, designs, models, *rangolis*, posters, albums, and simple maps (of school/neighbourhood, flow diagrams, etc.) using local/waste material.
- voices opinion on issues observed/experienced in, family/ school/ neighbourhood, e.g., on stereotypes (making choices/ decision making/solving problems), discriminatory practices on caste in use of public places, water, MDM/ community eating, child rights (schooling, child abuse, punishment, labour).
- suggests ways for hygiene, reduce, reuse, recycle and takes care of different living beings (plants, animals, and the elderly, differently abled people), resources (food, water, and public property).

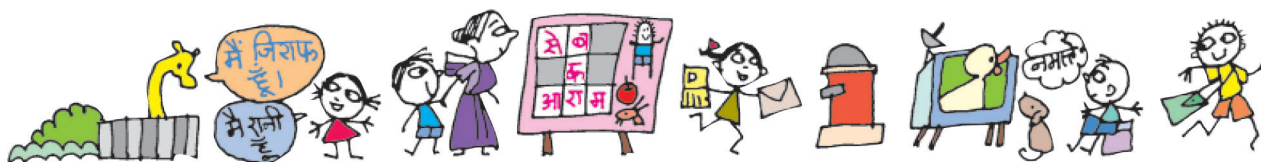


- explore/read books, newspaper clippings, audio, stories,/poems, pictures/videos/ tactile /raised material/web resources/ library and any other resources besides textbooks.
- enquire from parents, teachers, peers and elders at home/community, discuss, critically think and reflect on experiences of children related to situations at home, school, neighbourhood on reuse and reduction of waste, proper use and care of the public property, care of different animals, water pollution and wastage, health, and hygiene
- enquire/care about participation of female members in stereotypical activities for play/work, limited/restricted access of some children/persons/families (differently abled, castes, the aged) to common places/ resources, etc.
- participate actively and undertake initiatives of care, share empathy, leadership by working together in groups e.g., in different indoor/outdoor/local/contemporary activities and games, carry out projects/ role play for taking care of a plant(s), feed birds/animals, things/elderly/differently abled around them.



Class V (EVS)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learners may be provided opportunities in pairs/groups/individually and encouraged to —</p> <ul style="list-style-type: none"> observe and explore the animals for the unique and unusual sense of sight, smell, hear, sleep, and their response to light, heat, sound etc. explore the sources of water in their neighbourhood, and how fruit, vegetables, grains, water, reach their home and kind of processes/techniques employed to convert grain to flour and flour to <i>Roti</i>, purification of water etc. share experiences and discuss about the information collected or places visited with peers, teachers and elders prepare guide routes to reach from one place to another collect information from pictures / elders/ books/ newspapers/ magazines/web resources / museums etc. about animals which have very sharp sense of hearing, smell and vision, different landforms such as plain area, hilly area, deserts, etc. and the varieties of flora-fauna, lives of people in such places discuss with teachers and elders and use pictures, paintings, visit museums and collect information related to the lives for food, shelter, availability of water, means of livelihood, practices, customs, techniques, of different regions and different time periods visit petrol pumps, nature centers, science parks, water treatment plant, bank, health centre, wildlife sanctuaries, cooperative, monument, museum and if possible, far off places with different landforms, lifestyles and livelihoods, etc. to observe and interact with people living there and share experiences in different ways 	<p>The learner —</p> <ul style="list-style-type: none"> explains the super senses and unusual features (sight, smell, hear, sleep, sound, etc.) of animals and their responses to light, sound, food etc. explains the use of technology and the process of accessing basic needs (food, water etc.) in our daily life. (e.g., farm produce to kitchen; grains to <i>Roti</i>, preservation techniques, storage and tracking of water source) describes the interdependence among animals, plants and humans. (e.g., communities earning livelihood from animals, dispersal of seeds etc.) explains the role and functions of different institutions in daily life. (Bank, Panchayat, cooperatives, police station, etc.) establishes linkages among terrain, climate, resources (food, water, shelter, livelihood) and cultural life. (e.g., life in distant/difficult areas like hot/cold deserts) groups objects, materials, activities for features and properties such as- shape, taste, colour, texture, sound, traits etc. traces the changes in practices, customs, techniques of past and present through coins, paintings, monuments, museum etc. and interacting with elders. (e.g., cultivation, conservation, festivals, clothes, transport, materials or tools, occupations, buildings and houses, practices activities like cooking, eating, working) guesses (properties, conditions of phenomena), estimates spatial quantities (distance, area, volume, weight etc.) and time in simple standard units and verifies using simple tools/set ups. (e.g., floating/ sinking/ mixing/evaporation /germination /spoilage /breathing /taste)



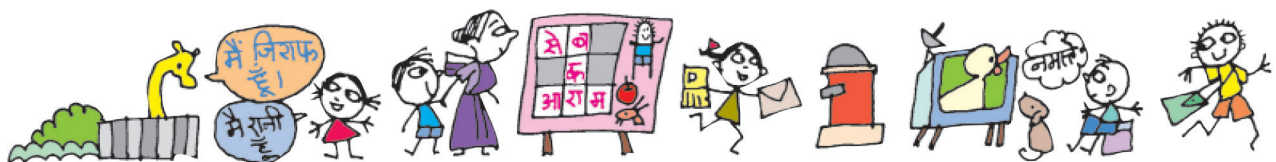
- observe and share experiences for different phenomena such as how water evaporates, condenses, and dissolves different substances under different conditions, and how food gets spoilt, how seeds germinate and the direction in which roots, shoot grow and conduct simple experiments and activities to find out the same
- conduct activities and simple experiments to check the properties/ features of different objects/ seeds/ water/waste materials, etc.
- observe, explore surroundings and critically think how seeds reach from one place to another, how the plants and trees grow at places where no one plants them e.g., forests, who waters them and who owns them
- visit the night shelters, people living in camps, old age homes, in surroundings and interact with old and/or differently abled and who change their means of earning to find out where do people belong to and why they left their places, where their ancestors had been living for ages, migration of people and debate on various such issues in the surroundings
- enquire from parents, teachers, peers and elders at home/community to critically think and discuss to reflect on experiences of children related to situations at home, school, neighbourhood
- discuss freely with peers, teachers and elders about the biases, prejudices, and stereotypes by providing counter examples to one another
- visit departments/ bodies in the surroundings e.g., Bank, Jal Board, and Hospital and Disaster management body and interact with related people and interpret different documents related to them

- records observations and experiences; information in an organised manner (e.g., in tables/ sketches/ bar graphs/ pie charts) and predicts patterns in activities/ phenomena (e.g., floating, sinking, mixing, evaporation, germination, spoilage) to establish relation between cause and effect.
- identifies signs, directions, location of different objects/landmarks of a locality / place visited in maps and predicts directions in context of positions at different places for a location
- creates posters, designs, models , set ups, local dishes, sketches, maps (of neighbourhood/ different places visited) using a variety of local/waste material and writes poems/ slogans/travelogue etc.
- voices opinions on issues observed/ experienced and relates practices / happenings to larger issues of society. (e.g., discrimination for access/ownership of resources, migration/ displacement / exclusion, child rights)
- suggests ways for hygiene, health, managing waste, disaster/emergency situations and protecting/saving resources (land, fuels, forests, etc.) and shows sensitivity for the disadvantaged/deprived.



- watch videos on different types of landforms and the variety of life forms found in such places, different institutions which cater to the need of societies, behaviour of animals, water scarcity, etc. followed by meaningful discussions and debates on occupations that derive from the peculiar geographical characteristics of different regions
- perform simple activities, record the observations in the form of table/ sketch/ bar graph/ pie chart/ oral/ written form, etc. interpret and present their findings
- discuss issues of living beings (plants and animals) as rightful inhabitants of earth, animal rights and ethical treatment to animals
- share experiences of people who work selflessly for common good and what motivates them
- participate actively and undertake initiatives of care, share empathy, leadership by working together in groups e.g., in different indoor/outdoor/local/contemporary activities, games, dance, fine art, carry out projects/role play for taking care of a plant(s), feed birds/animals, things/elderly/differently abled around them
- conduct mock drills for emergency and disaster preparedness.

Note: For addressing the inclusive aspect in EVS please refer to the Guidelines given for Children With Special Needs under Science and Social Science sections.



LEARNING OUTCOMES IN SCIENCE

UPPER PRIMARY STAGE

Introduction

Science is a dynamic and expanding body of knowledge, covering new domains of experiences. It is a human endeavour to understand the world by building-up conceptual models on the basis of observations and thus arriving at theories, laws and principles. In a progressive society, science can play a truly liberating role, helping people escape from the vicious cycle of poverty, ignorance and superstition. People today are faced with an increasingly fast-changing world where the most important skills are flexibility, innovation and creativity. These different imperatives have to be kept in mind in shaping science education. Good science education is true to the child, true to life and true to the discipline.

As consistent with the stage of cognitive development, science is being taken as a core subject in the curriculum at the upper primary stage. At this stage, it is a gradual transition from environmental studies of the primary stage to the elements of science. It is important to expand the horizon of the child gradually and start with things that are within the direct experiences of the child. The child should be engaged in learning the principles of science through familiar experiences, working with hands to design simple technological units and models and continuing to learn more about the environment and health, including reproductive and sexual health. Scientific concepts are to be arrived at mainly from activities, experiments and surveys. Group activities, discussions with peers and teachers, surveys, organisation of data and their display through exhibitions, etc., in schools and the neighbourhood should be important components of pedagogy.

Curricular Expectations

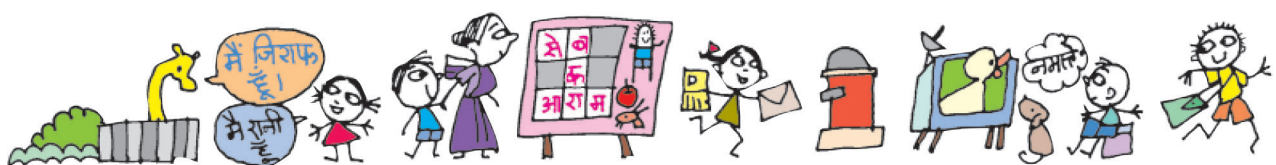
Science curriculum at the upper primary stage is intended to develop:

- scientific temper and scientific thinking
- understanding about the nature of scientific knowledge, i.e., testable, unified, parsimonious, amoral, developmental and creative.
- process skills of science which includes observation(s), posing question(s), searching various resources of learning, planning investigations, hypothesis formulation and testing, using various tools for collecting, analysing and interpreting data, supporting explanations with evidences, critically thinking to consider and evaluate alternative explanations, reflecting on their own thinking.

- appreciation for historical aspects of evolution of science.
- sensitivity towards environmental concerns.
- respect for human dignity and rights, gender equity, values of honesty, integrity, cooperation and concern for life.

The curriculum has been organised around the following themes that are cross disciplinary in nature:

- food
- materials
- the World of the Living
- moving Things, People and Ideas
- how Things Work
- natural Phenomena
- natural Resources

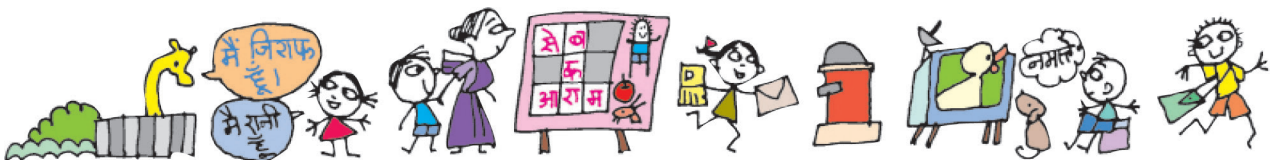


Class VI (Science)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner is to be provided with opportunities in pairs/groups/ individually in an inclusive setup and encouraged to—</p> <ul style="list-style-type: none"> • explore surroundings, natural processes, phenomena using senses viz. seeing, touching, tasting, smelling, hearing • pose questions and find answers through reflection, discussion, designing and performing appropriate activities, role plays, debates, use of ICT, etc. • record the observations during the activity, experiments, surveys, field trips, etc. • analyse recorded data, interpret results and draw inference/ make generalisations and share findings with peers and adults • exhibit creativity presenting novel ideas, new designs/patterns, improvisation, etc. • internalise, acquire and appreciate values such as cooperation, collaboration, honest reporting, judicious use of resources, etc. 	<p>The learner—</p> <ul style="list-style-type: none"> • identifies materials and organisms, such as, plant fibres, flowers, on the basis of observable features, i.e., appearance, texture, function, aroma, etc. • differentiates materials and organisms, such as, fibre and yarn; tap and fibrous roots; electrical conductors and insulators; on the basis of their properties, structure and functions • classifies materials, organisms and processes based on observable properties, e.g., materials as soluble, insoluble, transparent, translucent and opaque; changes as can be reversed and cannot be reversed; plants as herbs, shrubs, trees, creeper, climbers; components of habitat as biotic and abiotic; motion as rectilinear, circular, periodic etc. • conducts simple investigations to seek answers to queries, e.g., What are the food nutrients present in animal fodder? Can all physical changes be reversed? Does a freely suspended magnet align in a particular direction? • conducts simple investigations to seek answers to queries, e.g., What are the food nutrients present in animal fodder? Can all physical changes be reversed? Does a freely suspended magnet align in a particular direction? • relates processes and phenomenon with causes, e.g., deficiency diseases with diet; adaptations of animals and plants with their habitats; quality of air with pollutants, etc. • explains processes and phenomenon, e.g., processing of plant fibres; movements in plants and animals; formation of shadows; reflection of light from plane mirror; variations in composition of air; preparation of vermicompost, etc. • measures physical quantities and expresses in SI units, e.g., length • draws labelled diagrams / flow charts of organisms and processes, e.g., parts of flowers; joints; filtration; water cycle, etc.



- constructs models using materials from surroundings and explains their working, e.g., pinhole camera, periscope, electric torch, etc.
- applies learning of scientific concepts in day-to-day life, e.g., selecting food items for a balanced diet; separating materials; selecting season appropriate fabrics; using compass needle for finding directions; suggesting ways to cope with heavy rain/drought, etc.
- makes efforts to protect environment, e.g., minimising wastage of food, water, electricity and generation of waste; spreading awareness to adopt rain water harvesting; care for plants, etc.
- exhibits creativity in designing, planning, making use of available resources, etc.
- exhibits values of honesty, objectivity, cooperation, freedom from fear and prejudices.

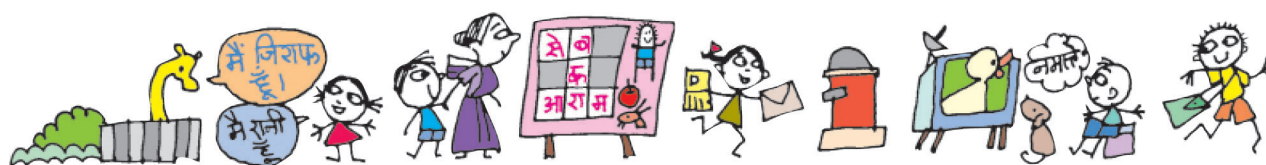


Class VII (Science)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner is to be provided with opportunities in pairs/groups/individually in an inclusive setup and encouraged to —</p> <ul style="list-style-type: none"> • explore surroundings, natural processes, phenomena using senses viz. seeing, touching, tasting, smelling, hearing • pose questions and find answers through reflection, discussion, designing and performing appropriate activities, role plays, debates, use of ICT, etc. • record the observations during the activity, experiments, surveys, field trips, etc. • analyse recorded data, interpret results and draw inference/ make generalisations and share findings with peers and adults • exhibit creativity presenting novel ideas, new designs/patterns, improvisation, etc. • internalise, acquire and appreciate values such as cooperation, collaboration, honest reporting, judicious use of resources, etc. 	<p>The learner —</p> <ul style="list-style-type: none"> • identifies materials and organisms, such as, animal fibres; types of teeth; mirrors and lenses, on the basis of observable features, i.e., appearance, texture, functions, etc. • differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function • classifies materials and organisms based on properties/characteristics, e.g., plant and animal fibres; physical and chemical changes • conducts simple investigations to seek answers to queries, e.g., Can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours? • relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc. • explains processes and phenomena, e.g., processing of animal fibres; modes of transfer of heat; organs and systems in human and plants; heating and magnetic effects of electric current, etc. • writes word equation for chemical reactions, e.g., acid-base reactions; corrosion; photosynthesis; respiration, etc. • measures and calculates e.g., temperature; pulse rate; speed of moving objects; time period of a simple pendulum, etc. • draws labelled diagrams/ flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc. • plots and interprets graphs e.g., distance-time graph



- constructs models using materials from surroundings and explains their working, e.g., stethoscope; anemometer; electromagnets; Newton's colour disc ,etc.
- discusses and appreciates stories of scientific discoveries
- applies learning of scientific concepts in day-to-day life, e.g., dealing with acidity; testing and treating soil; taking measures to prevent corrosion; cultivation by vegetative propagation; connecting two or more electric cells in proper order in devices; taking measures during and after disasters; suggesting methods for treatment of polluted water for reuse, etc.
- makes efforts to protect environment, e.g., following good practices for sanitation at public places; minimising generation of pollutants; planting trees to avoid soil erosion; sensitising others with the consequences of excessive consumption of natural resources, etc.
- exhibits creativity in designing, planning, making use of available resources, etc.
- exhibits values of honesty, objectivity, cooperation, freedom from fear and prejudices



Class VIII (Science)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner is to be provided with opportunities in pairs/groups/ individually in an inclusive setup and encouraged to —</p> <ul style="list-style-type: none"> • explore surroundings, natural processes, phenomena using senses viz. seeing, touching, tasting, smelling, hearing. • pose questions and find answers through reflection, discussion, designing and performing appropriate activities, role plays, debates, use of ICT, etc. • record the observations during the activity, experiments, surveys, field trips, etc. • analyse recorded data, interpret results and draw inference/ make generalisations and share findings with peers and adults • exhibit creativity presenting novel ideas, new designs/patterns, improvisation, etc. • internalise, acquire and appreciate values such as cooperation, collaboration, honest reporting, judicious use of resources, etc 	<p>The learner —</p> <ul style="list-style-type: none"> • differentiates materials and organisms, such as, natural and human made fibres; contact and non-contact forces; liquids as electrical conductors and insulators; plant and animal cells; viviparous and oviparous animals, on the basis of their properties, structure and functions. • classifies materials and organisms based on properties/ characteristics, e.g., metals and non metals; <i>kharif</i> and <i>rabi</i> crops; useful and harmful microorganisms; sexual and asexual reproduction; celestial objects; exhaustible and inexhaustible natural resources, etc. • conducts simple investigations to seek answers to queries, e.g., What are the conditions required for combustion? Why do we add salt and sugar in pickles and <i>murabbas</i>? Do liquids exert equal pressure at the same depth? • relates processes and phenomenon with causes, e.g., smog formation with the presence of pollutants in air; deterioration of monuments with acid rain, etc. • explains processes and phenomenon, e.g., reproduction in human and animals; production and propagation of sound; chemical effects of electric current; formation of multiple images; structure of flame, etc. • writes word equation for chemical reactions, e.g., reactions of metals and non-metals with air, water and acids, etc. • measures angles of incidence and reflection, etc. • prepares slides of microorganisms; onion peel, human cheek cells, etc., and describes their microscopic features • draws labelled diagram/ flow charts, e.g., structure of cell, eye, human reproductive organs; experimental set ups, etc. • constructs models using materials from surroundings and explains their working, e.g., <i>ektara</i>, electroscope, fire extinguisher, etc.



- applies learning of scientific concepts in day-to-day life, e.g., purifying water; segregating biodegradable and non-biodegradable wastes; increasing crop production; using appropriate metals and non-metals for various purposes; increasing/ reducing friction; challenging myths and taboos regarding adolescence, etc.
- discusses and appreciates stories of scientific discoveries
- makes efforts to protect environment, e.g., using resources judiciously; making controlled use of fertilisers and pesticides; suggesting ways to cope with environmental hazards, etc.
- exhibits creativity in designing, planning, making use of available resources, etc.
- exhibits values of honesty, objectivity, cooperation, freedom from fear and prejudices

For Children With Special Needs (EVS and Science)

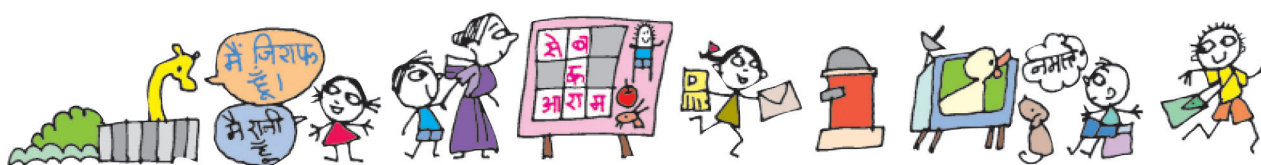
In learning EVS and Science, some students may require support with mobility or manipulation skills to participate in experiments or other hands on activities being performed both indoors and outdoors. Students can benefit from adapted or alternative activities, adapted equipment, the use of ICT, adult or peer support, additional time, and support in lessons that may not be accessible to them because of their impairment. Additional care may be taken for some specific needs as mentioned below.

For Visually Impaired children

- Abstract and difficult concepts
- Experiments, especially that involve physical safety
- Requirement of more time
- Understanding visual inputs like chalkboard, demonstrations, presentations graphics and diagrams, etc.

For Hearing Impaired children

- Understanding abstract words and the connections between abstract concepts, knowledge, ideas; (science concepts like photosynthesis, habitat, microorganisms, etc. are difficult for these children to understand without visual representations.)
- Conducting experiments
- Solving problems that involve more than one dimension; For example, comparing objects on the basis of multiple



dimensions like number, size, shape, colour may be difficult as compared to single dimension like size only

For Children with Cognitive Impairments, Intellectual Disability

- Understanding the technical language of Science
- Drawing meaningful linkages/relationships between concepts (for example, between pressure and force)
- Planning, organising, sequencing and generalising
- Understanding abstract concepts
- Conducting or handling science experiments.



LEARNING OUTCOMES IN SOCIAL SCIENCES

UPPER PRIMARY STAGE

Introduction

Social Sciences at the upper primary stage primarily aims at understanding analytically various phenomena in the immediate social environment. The learners are introduced to the diversity of people and their practices in different societies, regions and cultures within societies. Social Sciences have an important role in generating sensitivity towards human values of compassion, empathy, trust, peace, cooperation, social justice, environmental protection and other concerns.

It develops with one's own social environment self, family, social environment and its interaction with various geographical, historical, social, economic, and political factors. Familiarizing the learner with the dynamics in the evolution process is necessary so that she/he develops sufficient awareness and necessary skills to understand these interlinked disciplines independently.

Curricular Expectations

It is expected that the learner, by the end of the upper primary stage (Class VIII), is able to meet the following curricular expectations:

- recognises ways in which political, social and economic issues which affect their daily lives across time and space.
- understands about the earth as the habitat of humans and other forms of life.
- becomes familiar with one's own region and realises interdependence of various regions (local to global).
- understands spatial distribution of resources and their conservation.
- understand historical developments in different periods of Indian history.
- comprehends how historians study the past using different types of sources.
- understands historical diversity to relate developments of one place/region with those of another.
- imbibes the values of the Indian Constitution and their significance in everyday life.
- gains a sense of the working of Indian democracy, its institutions and processes at the local, state and union levels.
- becomes familiar with socio-economic role of institutions such as family, market and government.
- recognises the contributions of different sections of society to political, social, cultural, and environmental processes.

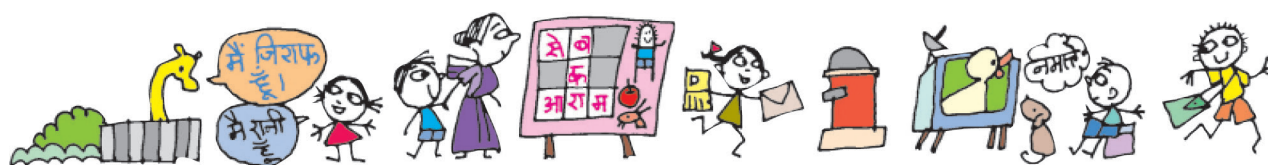
Class VI (Social Sciences)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner be provided opportunities in pairs/groups/ individually and encouraged to —</p> <ul style="list-style-type: none"> • use diagrams, models and audio-visual materials to understand motions of the earth. • observe stars, planets, satellite (Moon), eclipse under the guidance of parents/teacher/elders, etc. to understand astronomical phenomena. • use globe for understanding latitudes and longitudes. • use diagrams for understanding lithosphere, hydrosphere, atmosphere and biosphere. • explore maps for locating continents, oceans, seas, States/UTs of India, India and its neighbouring countries, physical feature of India such as mountains, plateaus, plains, deserts, rivers, etc. • discuss myths linked to eclipses. • use pictures, drawings of different types of sources to read, explain, discuss these to understand how historians have interpreted these to reconstruct history of ancient India. • undertake map activity: for locating important places, sites of hunter-gatherers; food producers, Harappan civilisation, <i>janapadas</i>, <i>mahajanapadas</i>, empires, places related to events in the life of the Buddha and Mahavira; centres of art and architecture-areas outside India with which India had contacts. • explore epics, <i>Ramayana</i>, <i>Mahabharata</i>, <i>Silappadikaram</i>, <i>Manimekalai</i> or some important works by Kalidas etc. • discuss basic ideas and central values of Buddhism, Jainism and other systems of thought- relevance of their teachings today- development of art and architecture in ancient India- India's contribution in the area of culture and science. • role play on various historical themes like change of Ashoka after Kalinga War-one of the events, incidents from literary works of the time etc. 	<p>The learner —</p> <ul style="list-style-type: none"> • distinguishes between stars, planets and satellites e.g., Sun, Earth and Moon • recognises that the earth is a unique celestial body due to existence of life, zones of the earth with special reference to biosphere • demonstrates day and night; and seasons • locates directions on the flat surface; and continents and oceans on the world map • identifies latitudes and longitudes, e.g., poles, equator, tropics, States/UTs of India and other neighbouring countries on globe and the world map • locates physical features of India such as- mountains, plateaus, plains, rivers, desert ,etc. on the map of India • draws a neighbourhood map showing scale, direction, and features with the help of conventional symbols • examines critically the superstitions related to eclipses • identifies different types of sources (archaeological, literary etc.) and describes their use in reconstruction of history of this period. • locates important historical sites, places on an outline map of India • recognises distinctive features of early human cultures and explains their growth • lists out significant contributions of important kingdoms, dynasties with examples viz., Ashokan inscriptions, Gupta coins, Ratha temples by Pallavas etc. • explains broad developments during the ancient period, e.g., hunting-gathering stage, the beginning of agriculture, the first cities on the Indus etc. and relates the developments occurring in one place with another • describes issues, events, personalities mentioned in literary works of the time • describes the implications of India's contacts with regions outside India in the fields of religion, art, architecture, etc.



- undertake projects on the evolution of state-working of *ganas* or *sanghas*– contributions of kingdoms, dynasties in the field of culture– India’s contact with areas outside India highlighting the impact of these contacts and classroom discussion on projects
- visit museums to see the material remains of early human settlements– Harappan and discuss the continuity and change between these cultures
- participate in discussions on the concepts of diversity, discrimination, government, and livelihood.
- observe examples of fair/unfair treatments to people meted out in the family, school, society, etc.
- study from the text and directly observe of functioning of a *Gram Panchayat* or a municipality/corporation (according to the place a student lives)
- understand the role of governance in society, and the difference between affairs of a family and those of a village/city.
- describe case studies of nearby localities/ villages in respect of occupations.

- outlines India’s significant contributions in culture and science viz. astronomy, medicine, mathematics, and knowledge of metals, etc.
- synthesises information related to various historical developments
- analyses basic ideas and values of various religions and systems of thought during ancient period
- describes various forms of human diversity around her/him.
- develops a healthy attitude towards various kinds of diversity around her/him
- recognises various forms of discrimination and understands the nature and sources of discrimination.
- differentiates between equality and inequality in various forms to treat them in a healthy way
- describes the role of government, especially at the local level.
- identifies various levels of the government— local, state and union
- describes the functioning of rural and urban local government bodies in sectors like health and education
- describes factors responsible for availability of different occupations undertaken in rural and urban areas.



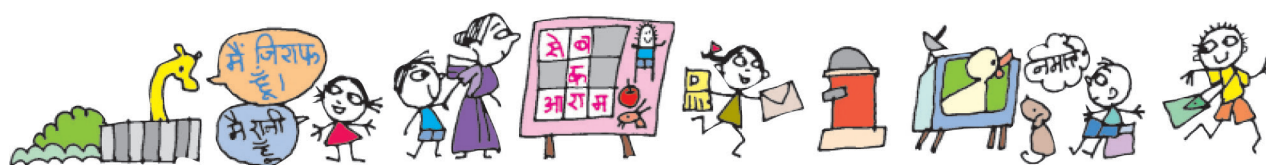
Class VII (Social Sciences)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner be provided opportunities in pairs/groups/ individually and encouraged to —</p> <ul style="list-style-type: none"> • engage with key concepts like ecosystem, atmosphere, disasters, weather, climate, climatic regions, etc., using meaningful explanations and appropriate resources • discuss and share their observations and experiences regarding various aspects of the environment, e.g., components of natural and human made environments, flora and fauna in different ecosystems/ climatic regions, kinds of pollution, sources of fresh water in their surroundings, etc. • explore globe and maps for identifying historical places/kingdoms, climatic regions, and other resources • use diagrams/ models/visuals/audio-visual materials for understanding interior of the earth, formation of different types of landforms, movements of water in the ocean, etc. • prepare models to display different types of landforms • collect samples and identify different types of rocks from the vicinity • participate in mock drill for earthquakes or other disasters • discuss factors, both natural and human-made that cause disasters like tsunamis, floods, earthquakes, etc. • discuss similarities and differences in the life of people in different climatic regions of the world, including India • identify different sources of history available in books/local environment e.g., extracts from manuscripts/ maps/ illustrations/ painting/historical monuments/films, biographical dramas, tele-serials, folk dramas and interpret these to understand the time. • familiarise with the emergence of new dynasties and prepare a timeline to trace important developments during this time 	<p>The learner —</p> <ul style="list-style-type: none"> • identifies major layers of the earth's interior, rock types, layers of the atmosphere in a diagram. • locates distribution and extent of different climatic regions on the world map or globe. • explains preventive actions to be undertaken in the event of disasters, e.g., earthquake, floods, droughts. • describes formation of landforms due to various factors. • explains composition and structure of the atmosphere. • describes different components of the environment and the interrelationship between them. • analyses factors contributing to pollution in their surroundings and lists measures to prevent it. • reasons and factors leading to diversity in flora and fauna, e.g., climate, landforms, etc. • reflects on the factors leading to disasters and calamities. • shows sensitivity to the need for conservation of natural resources– air, water, energy, flora and fauna • draws interrelationship between climatic regions and life of people living in different climatic regions of the world, including India • analyses factors that impact development of specific regions • provides examples of sources used to study various periods in history • relates key historical developments during medieval period occurring in one place with another. • explains the relationship between livelihood patterns and the geographical condition of the area inhabited, e.g., tribes, nomadic pastoralists and <i>banjaras</i>. • analyses socio-political and economic changes during medieval period



- enact/dramatise key events of a given historical period/personality like, Razia Sultan, Akbar etc.
- reflect on the changes in society during medieval period and compare it with present day time
- prepare projects: on dynasties/kingdoms/ administrative reforms and architectural specialties of a period, e.g., Khaljis, Mughals etc.
- engage with factors contributing to the emergence of new religious ideas and movements through the use of poems of saints/*bhajans*, *kirtans* or *qawwalis*/ visits to nearby *dargah*/ *gurudwara*/ temple associated with *bhakti* or *sufi* saints and discuss the basic tenets of different religions
- participate in a discussion on the concepts of democracy, equality, State Government, gender, media and advertising
- prepare posters with drawings and pictures on the significance of the Constitution, Preamble, right to equality
- and struggles for equality
- observe assembly constituency map of State/UTs
- organise a mock election and youth assembly
- debate about the role of media
- perform a role play with songs and poems about issues such as equality in democracy, discrimination faced by girls etc.
- express views, through descriptive and critical writing, about standards of living of girls and women in rural and urban areas.
- make oral and written presentations about women who worked for a better society
- prepare newspaper collages about the work being done by the State government on select issues (e.g., health, food, agriculture, roads) and some public works undertaken by the MLA of one's own constituency
- do projects (solo, pair or group) about types of advertisements and create advertisements about the need to save water and energy

- analyses administrative measures and strategies for military control adopted by different kingdoms, e.g., the Khaljis, and Tughluqs, Mughals, etc.
- draws comparisons between policies of different rulers
- describes distinctive developments in style and technology used for construction of temples, tombs and mosques with examples.
- analyses factors which led to the emergence of new religious ideas and movements (*bhakti* and *sufi*)
- draws inferences from poetry of *bhakti* and *sufi* saints about existing social order
- explains the significance of equality in democracy
- distinguishes between political equality, economic equality, and social equality
- interprets social, political and economic issues in one's own region with reference to the right to equality
- differentiates between local government and State government.
- describes the process of election to the legislative assembly
- locates one's own constituency on assembly constituency map of State/UTs and names local MLA
- analyses the causes and consequences of disadvantages faced by women of different sections of the society.
- identifies women achievers in different fields from various regions of India
- illustrates contribution of women to different fields with appropriate examples
- explains the functioning of media with appropriate examples from newspapers.
- creates an advertisement
- differentiates between different kinds of markets
- traces how goods travel through various market places.

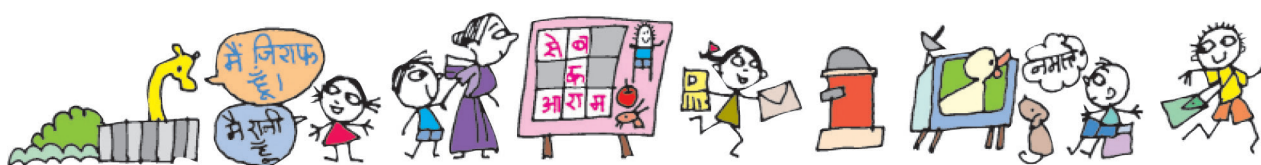


- organise awareness drives in one's own locality about sanitation, public health and road safety
- visit any office under the state government / UT Administration (e.g., electricity bill office) in one's own locality to observe its functioning and prepare a brief report
- undertake case studies and projects about local markets and shopping complexes through field visits.



Class VIII (Social Sciences)

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner be provided opportunities in pairs/groups/ individually and encouraged to —</p> <ul style="list-style-type: none"> • collect information about distribution of various natural resources like land, soil, water, natural vegetation, wildlife, minerals, power resources, types of industries in their environs and relate it with India and the world. • explore various farming practices carried out in the neighbourhood/ district/ state and interact with farmers. • use pictures/news clippings/ videos to be familiar with the availability of natural resources and their protection, various agricultural practices in other states/ countries . • develop projects on conservation of natural and human made resources • discuss with peers about forest fire, landslide, industrial disasters, natural and human reasons for their occurrence and control measures. • use atlas /maps for locating major agricultural areas of the world, industrial countries/regions, understanding spatial distribution of population. • read stories of lived experiences of individuals and communities of the period. • discuss events and processes in groups and as a whole in the classroom situation. • raise questions on different issues and events like, ‘Why the English East India Company felt it necessary to involve itself in feuds amongst Indian rulers?’. • visit places of historical importance particularly those associated with centres of colonial administration and Indian national movement. 	<p>The learner —</p> <ul style="list-style-type: none"> • classifies different types of industries based on raw materials, size and ownership • describes major crops, types of farming and agricultural practices in her/his own area/ state • interprets the world map for uneven distribution of population • describes causes of forest fire, landslide, industrial disasters and their risk reduction measures • locates distribution of important minerals, e.g., coal and mineral oil on the world map • analyses uneven distribution of natural and human made resources on the earth • justifies judicious use of natural resources such as water, soil, forest, etc. to maintain developments in all areas • analyses the factors due to which some countries are known for production of major crops, e.g., wheat, rice, cotton, jute, etc., and locates these countries on the world map • draws interrelationship between types of farming and development in different regions of the world • draws bar diagram to show population of different countries/India/states distinguishes the ‘modern period’ from the ‘medieval’ and the ‘ancient’ periods through the use of sources, nomenclatures used for various regions of the Indian sub-continent and the broad developments • explains how the English East India Company became the most dominant power



- undertake 'projects' and 'activities' like (a) writing an essay on "Gandhiji's Idea of Non-violence and its Impact on India's National Movement", (b) drawing up a timeline on 'Significant Events of India's National Movement', (c) enacting a role play on 'The Chauri Chaura Incident,' and (d) locating on an outline map of India the 'Regions Most Effected by Commercial Crop Cultivation during the Colonial Period'.
- familiarise with sources like vernacular and British accounts, autobiographies, biographies, novels, paintings, photographs, contemporary writings, documents, newspaper reports, films, documentaries and also recent writings to understand and reconstruct histories of various movements.
- expose to pedagogically innovative and criterion-referenced questions for self-assessment like 'What were the reasons for the Battle of Plassey?'
- participate in a discussion on the concepts of Constitution, Parliament, judiciary and marginalisation
- prepare posters with drawings and pictures and make oral and written presentations on the significance of the Constitution of India, Preamble, Parliamentary government, separation of powers, federalism
- debate how the principles of liberty, equality and fraternity are being practised in classroom/ school/ home/ society
- do projects (solo, pair or group) about the Fundamental Rights and Fundamental Duties
- screen and discuss the Rajya Sabha TV series, Samvidhan and movies such as Gandhi, Sardar, Dr. Babasaheb Ambedkar.
- observe parliamentary constituency map of State/UTs
- organise a mock election with model code of conduct and Youth parliament (*Bal Sansad*)
- prepare a list of registered voters in one's own neighbourhood.
- carry out an awareness campaign in one's own locality about significance of voting
- find out some public works undertaken by the MP of one's own constituency
- explains the differences in the impact of colonial agrarian policies in different regions of the country like the 'indigo rebellion'
- describes the forms of different tribal societies in the 19th century and their relationship with the environment.
- explains the policies of the colonial administration towards the tribal communities
- explains the origin, nature and spread of the revolt of 1857 and the lessons learned from it
- analyses the decline of pre-existing urban centres and handicraft industries and the development of new urban centres and industries in India during the colonial period
- explains the institutionalisation of the new education system in India
- analyses the issues related to caste, women, widow remarriage, child marriage, social reforms and the laws and policies of colonial administration towards these issues
- outlines major developments that occurred during the modern period in the field of arts
- outlines the course of the Indian national movement from the 1870s till Independence
- analyses the significant developments in the process of nation building
- interprets social and political issues in one's own region with reference to the Constitution of India illustrates the Fundamental Rights and the Fundamental Duties with appropriate examples
- applies the knowledge of the Fundamental Rights to find out about their violation, protection and promotion in a given situation (e.g., Child Rights)
- differentiates between State government and Union government
- describes the process of election to the Lok Sabha
- locates one's own constituency on parliamentary constituency map of State/ UT and names local MP

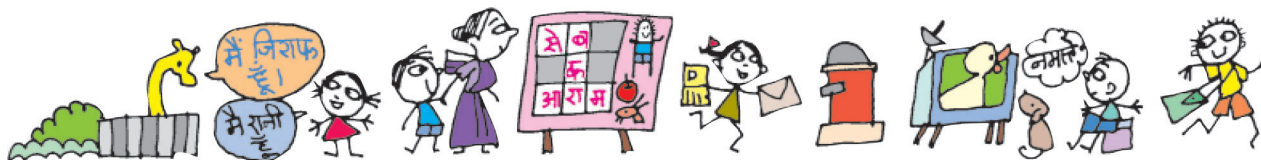


- examine contents of a First Information Report (FIR) form.
- express views, through descriptive and critical writing, about the role of judges in the delivery of justice to the litigants
- conduct focus group discussions on violation, protection and promotion of human rights, especially of women, SCs, STs, religious/ linguistic minorities, persons with disabilities, children with special needs, sanitation workers, and other disadvantaged sections
- screen and discuss the movie, I am Kalam (Hindi, 2011)
- perform a role play about child labour, child rights, and the criminal justice system in India
- visit any office under the Union Government (e.g., post office) in one's own locality to observe its functioning and prepare a brief report
- share experiences with peers on public facilities and reasons for the disparity in availability of water, sanitation, electricity
- organise a debate why Government be responsible for providing public facilities
- case studies or newspaper clippings can be provided to learners as an example of the negligence in enforcement of the laws and compensation
- group discussion on role of Government in regulating economic activities, e.g., analysing the reasons of 'Bhopal gas tragedy'.

- describes the process of making a law. (e.g., Domestic Violence Act, RTI Act, RTE Act)
- describes the functioning of the judicial system in India by citing some landmark cases
- demonstrates how to file a First Information Report (FIR)
- analyses the causes and consequences of marginalisation faced by disadvantaged sections of one's own region
- identifies the role of Government in providing public facilities such as water, sanitation, road, electricity etc., and recognises their availability
- describes the role of Government in regulating economic activities.

For Children With Special Needs (Social Sciences)

- In order to achieve learning outcomes in EVS and Social Sciences, some students may require support in the form of prepared tapes, talking books/daisy books to access text; help in writing to communicate their ideas through alternative communication methods such as ICT or speech; adaptation of content and activities; education aids to manage visual information; and/or support to understand various geographical concepts and features and the environment.
- Group activities such as projects and assignments done through cooperative learning will enable students with SEN to participate actively in all classroom activities.
- For Children With Special Needs (CWSN), resources such as tactile diagrams/maps, talking books, audio-



visual materials, Braille, etc. may be used. Pedagogical processes and learning outcomes in the document are not exhaustive. Teachers are expected to design and follow appropriate pedagogical processes along with assessment tasks to assess their students to continuously improve learning outcomes.

For Visually Impaired children

- Verbal content including geographical terms and concepts, for example, latitude, longitudes, directions etc.
- Graphic and visual descriptions like map reading, graphs, diagrams, paintings, inscriptions, symbols and monumental architecture etc.
- Making observations of environment and space – land, climate, vegetation and wildlife, distribution of resources and services
- Reference material like spelling lists, study questions, important references, and other information students may need to refer can be provided in enlarged, tactile or embossed formats or redrawn with proper contrasts.

For Hearing Impaired children

- Understanding of terminologies/technical terms, abstract concepts, facts, comparisons, cause effect relationships and chronology of events etc.
- Reading heavy text (textbooks/source materials) especially in History and Civics
Making inferences from the text.

For Children with Cognitive Impairments, Intellectual Disability

- Accessing written work, illustrations, charts, graphs and maps (especially for students with cognitive processing problems— visual spatial/visual processing / perceptual)
- Extracting relevant information from bulk information. Text heavy subjects like History are a challenge for students with reading difficulties
- Remembering the sequence of events and connecting them
- Understanding and interpreting abstract concepts
- Generalisation and relating information in the textbooks with the environment or society.

