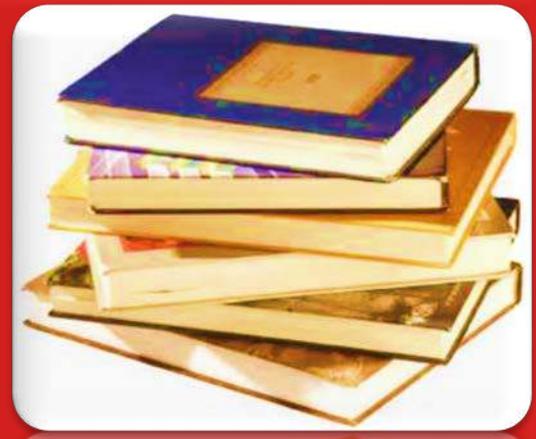


ICSE
CLASS 8
SYLLABUS

ENGLISH

English



English language occupies a central place in the school curriculum because it is the medium for learning. Proficiency in the language is a pre-requisite for effective communication and knowledge acquisition. Language learning does not necessarily take place only in the language classroom. It cuts across the curriculum of different disciplines. English plays an important and integral role in the domains of education, medicine, business and international relations, judiciary, industry, etc. It is central to children's intellectual, social, and emotional growth and all round development.

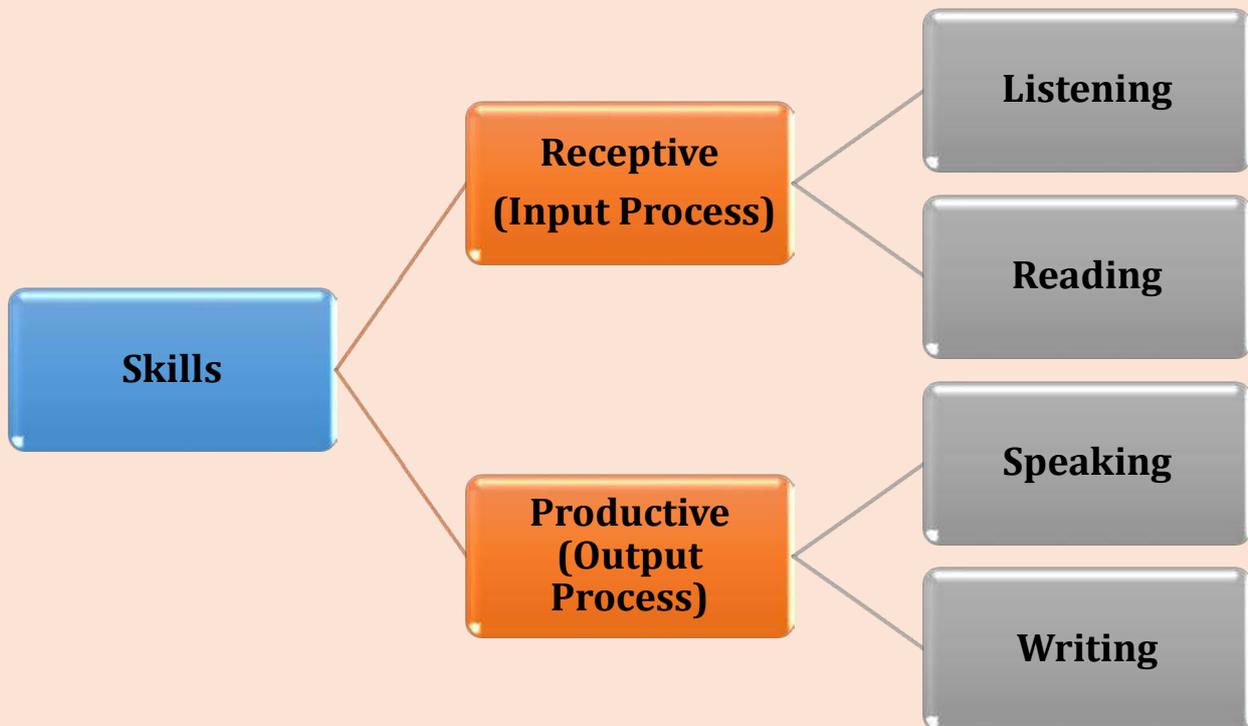
The content of the language curriculum should be broad enough to encompass the needs and interests of children. Classroom activities need to be linked to life outside the classroom. Socio-cultural contexts that encourage children to participate actively in understanding and creating appropriate communicative practices should be promoted through development of linguistic skills. English as a language should be developed progressively through meaningful experiences rather than a mere drill or rote exercise.

Children need to be able to use language to express their feelings, ideas and later to express their opinions based on extensive readings and research. As they gradually become aware of the various purposes for which language is used and the diverse forms it can take, they learn to use language appropriate to context. They also develop an awareness of how language is used in different formal and informal situations. Language is also the basis for thinking, communicating, learning and developing life skills. Children need language skills in order to comprehend ideas and information, interact socially, inquire into areas of interest and study, and express themselves clearly and fluently with confidence

Learning to communicate with clarity and precision, orally, in writing, and through a variety of media, helps children understand the world around them. Through a rich variety of literary, academic, and media related texts, children learn to read and reflect on the world around them and appreciate different worldviews and critically interpret a range of texts. Importantly, through language children can be sensitized to the physical and social environment, life skills and values.

Life skills such as communication skills, critical thinking, sharing, caring, becoming aware of the self, showing concern for others and developing sensitivity to the world around them, should be an inbuilt component of an English Classroom. It is important to nurture these life skills among children by giving them ample opportunities for experiencing such situations. Texts and tasks in the classroom need to have scope for developing the desired life skills as per the topic/theme, which may be linked across the curriculum.

Since language development refers to the skills used in expressing and communicating ideas, it involves the four basic aspects of listening, speaking, reading and writing, which would also inculcate elements of critical thinking.



At the primary level, children’s process of learning gradually and progressively moves from hearing to listening, to speech to reading and finally writing. With progression of time children continue to develop and refine their skills in these aspects of language. The emphasis on the development of skills in a language class is not to be viewed as a mechanical activity devoid of life but as the cornerstone of experience, appreciation and creative expression. Feeling, expression and its application all move together, so when a child acquires proficiency in reading and writing, the door to literary appreciation and creativity is opened.

By the time they reach Class VI, children would have acquired basic proficiency in English language and hence opportunities must be provided to further hone their skills. They need to interact with social media, have diverse exposure and develop independent thinking. Their experiences need to be channelled as creative expressions in the English classroom.

The English language curriculum has been planned to develop language skills. The broad **objectives of language teaching and learning** are:

(a) To develop listening skills: Children learn to use verbal and non-verbal cues in a non-linear way to comprehend and draw inferences.

(b) To develop speaking skills: Children develop effective communicative skills and are able to engage in meaningful conversation in various situations. They engage in discussions in a logical, analytical, and creative manner.

(c) To develop reading skills: Children develop the habit of independent reading and are able to construct meaning by drawing inferences and relating the text to their previous knowledge. They also develop the confidence of reading the text critically and are able to pose questions accordingly.

(d) To develop writing skills: Children develop the confidence to express thoughts effortlessly and in an organized manner. They follow the process approach to writing that enables them to write for a variety of purposes and situations, ranging from informal to formal.

To achieve these objectives children are to be provided with an environment to facilitate language learning. This could take shape in the form of textbooks, story books, magazines, newspapers, audio/visual aids, children chosen texts etc. according to the interest, age and cognitive levels of children. All modalities like visual, auditory and kinaesthetic may be used in pedagogical processes. Care must be taken by teachers to provide support to differently abled children in the classroom transactional processes. For example, material in Braille for the sight impaired and sign language devices for hearing impaired children i.e. adopting and adapting the curriculum according to the learning abilities of children with special needs.

Though skills have been outlined and graded, textual material that are used at a school and the time spent at each level may vary. However, we urge teachers to maintain the experiential background of children and ensure the availability of materials. The curriculum provides space to teachers to use their initiative to supplement and substitute matter according to their contexts.

Guidelines for English language learning:

Content/ Themes

The language classroom is a place where contemporary concerns and issues can be included as the curriculum ranges from non-literary to literary texts, from local to global covering a wide range of areas like environmental issues, sustainable development, maintenance of resources, concern for animals and plants, human rights, etc. The selection of the materials can draw upon the following and additional themes in an integrated manner:

Self, family, home, friends, neighbourhood, environment, animals, plants, arts, culture sports, travel, tourism, mass media, science and technology, health and hygiene, peace, life skills etc.

Integrating Language Teaching with other Areas



Along with the above themes the choice of texts should also focus on myths, legends, and folktales to develop appreciation for socio-cultural and linguistic heritage. Translated texts from Indian languages and the other languages of the world may be included in classroom teaching to encourage children to experience the rich diversity of language.

(a) Guiding Principles for English language:

- ➔ Connecting learning to the outside world.
- ➔ Integrating English with other subjects across the curriculum
- ➔ Adopting multilingualism as a learning resource.
- ➔ Using contexts to develop language as a whole.
- ➔ Making assessment for learning a part of the teaching learning process.
- ➔ Ensuring an active participation of children by using a variety of activities and tasks.

(b) Suggested Generic Classroom tasks that can be included as classroom procedures (Classes VI to VIII)

LISTENING AND SPEAKING

- Circle time
- Picture/ photograph description, etc.
- Story narration
- Role play, dramatisation, mime
- Elocution/ Recitation - Singly and in a group
- Intra-class debates
- Group discussions on specified topics.
- Dramatisation of poems/ prose
- Music– to be used to teach poetry, speech and drama
- Language Games – Word building, Pictionary, dumb charades, Guess the word etc.
- Build and use a class library
- Puzzles and crosswords, Scrabble
- Project presentations (oral)
- Film and audio clips

READING AND WRITING

- Reading – Loud, Group and silent (Literature)
- Word Wall (Literature)
- Vocabulary tree
- Completing a story
- Picture composition
- Poetry writing – limerick, doggerel, haiku, cinquain, Tanka, jingle
- Poster making, slogan and caption writing
- Writing newspaper reports and travel brochures
- Writing advertisements/ posters/ notices
- Recording a process (How I taught someone to cook/ read/ cycle/ swim, etc.)
- Maintaining a diary/ journal/ log book

- Book Talk, book review (Literature)
- Film review
- Restaurant review
- Illustrations of characters from texts (Literature)
- Comprehension – Seen text (Literature) and Unseen text.
- Comprehension of poems - seen (Literature) and unseen.
- Music to be used as a stimulus for aural comprehension.
- Comprehension/ literature questions must allow scope for
 - (i) inference,
 - (ii) personal response. Dissenting voices must be encouraged.
- Spell Check
- Pictogram
- Word search
- Spot the differences, unscramble the scrambled words
- Mind mapping
- Word Games
- Contributions to School magazine / Newsletter / Soft boards / Newspaper

VOCABULARY AND GRAMMAR IN CONTEXT

- Grammar activities in context
- Worksheets to consolidate grammatical concepts in context.
- Use of internet as a resource

CREATIVE WRITING

It is recommended that children write 10 - 12 written assignments / tasks in an academic year.

- The stimuli could be a picture, object/s or a set of words.
- Picture compositions must be conducted at all levels. The Picture should be in colour and depict a story having a human interest appropriate to the class level. Each child should have access to the picture.
- All writing exercises must begin with a class level conversation and words arising from the discussion must be noted on the blackboard (The words may be suggested by children). This scaffolding as pre-teaching helps children undertake their written tasks independently.
- Argumentative essays to be introduced in Class VIII, on issues that the children can identify with (e.g. “School Uniforms must be abolished”, “Homework must be made compulsory”).
- Classes VI & VII to write informal letters. **Topics for letters should be within the range of children’s experiences (example- letters to Parent, friends, relatives, neighbours etc.).**
- Formal letters to be introduced in Class VIII. **Topics for letters should be within the range of children’s’ experiences (example- letters to Principal, Teacher, Editor, Librarian, community function, etc.).**

Listening and Speaking

Children listen to an advanced level of academic discourse and prepare notes and summary for further deliberations using multimedia presentations.

Learning Outcomes:

Children will be able to:

- ☑ **listen** with interest, answer accurately and respond with an appreciation to a variety of questions in a text (seen and unseen) for aural/ written comprehension;
- ☑ **listen** to a talk /presentation /lecture and prepares notes;
- ☑ **prepare and participate** in class/ school-level discussions (having read/ researched material that is being studied);
- ☑ **engage** effectively in a range of collaborative discussions (group/ teacher-led) on class level texts, topics and issues;
- ☑ Build on others' ideas and express their own views clearly;
- ☑ make a planned oral presentation to a specific audience for an intended purpose;
- ☑ **integrate** multimedia and visual displays into presentations.

Listening and Speaking		
Suggested areas/Content	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Listen to a variety of texts from different genres and registers such as story, poems, narratives, lecture etc. for aural/written comprehension. ➤ Listen and comprehend issues/topics raised in spoken texts e.g. <ul style="list-style-type: none"> ☛ <i>speech</i> ☛ <i>lecture</i> ☛ <i>discourse</i> ☛ <i>debate</i> ☛ <i>discussion</i> ☛ <i>Group discussions</i> ➤ Use of graphics, images, music, sound and visual displays in presentations. ➤ Analyse and evaluate use of language in different contexts (newspapers, television, billboards and advertising campaigns) and its interpretation. ➤ Adapts speech to a variety of 	<ul style="list-style-type: none"> ➤ Reviewing and building on previous learning. ➤ Encouraging children to read extensively and beyond the text as preparation for the class. ➤ Creating opportunities for group/ team work and discussions in the class room (e.g. Panel discussion/ debate on topical issues like '<i>It's alright for Teachers and Students to interact on Social Media</i>' ➤ Creating opportunities for children to make a presentation to a target audience (e.g. conduct Morning Assembly at school/ deliver a welcome address/ vote of thanks at a school function. ➤ NOTE: <i>The examples given above are intended merely as guidelines. The teachers are</i> 	<ul style="list-style-type: none"> ➤ Audio/video clips/ in series or as per the topic. ➤ cartoons /poems/ narratives/autobiographies /biographies/ famous speeches/ songs, lyrics/debates etc. ➤ Articles from print and digital media etc. ➤ Posters/ Models/ advertisements/ Charts etc. ➤ Language games ➤ Activities and tasks ➤ School magazine/ class news paper ➤ School Assemblies and Clubs (Speech and Drama Club/ Quiz Club etc.)

Listening and Speaking

Suggested areas/Content	Suggested Transactional Processes	Suggested Learning Resources
<p>contexts and tasks e.g.</p> <ul style="list-style-type: none"> ☛ <i>tone</i> ☛ <i>gestures</i> ☛ <i>stress</i> ☛ <i>facial expressions</i> ☛ <i>body language</i> ☛ <i>voice modulation</i> ☛ <i>choice of words</i> <p>➤ Collect and collate ideas and seek clarification to keep discussions relevant.</p> <p>➤ Use multi-media to make presentations on issues and social messages i.e. drug abuse, values, life skills etc.</p>	<p><i>welcome to be as innovative as the class size and situation allows.</i></p> <p>➤ <i>The activities suggested above are not necessarily restricted to listening and speaking. As the language teacher is well aware, all four language skills are inter-related and often overlap.</i></p>	

Reading

Children read and critically evaluate the text from socio - political and cultural context along with other texts. They explore translated texts including myths, folktales, legends etc.

Learning Outcomes:

Children will be able to:

- ☑ **identify** the central theme of a given text and trace its development;
- ☑ use text to support argument and point of view about character and plot;
- ☑ **interpret** how particular lines of dialogue/ incidents in a story or drama propel the action or reveal aspects of character;
- ☑ **analyse**/ how differences in the points of view of the characters and the audience or reader create such effects as suspense or humour;
- ☑ **evaluate** the extent to which a filmed/ live production of a story or drama stays faithful to/ departs from the text;
- ☑ **examine** the extent to which a modern work of fiction draws on themes, patterns of events or character types from myths, traditional stories, or religious works;
- ☑ read, and comprehend literature, including stories, prose pieces, dramas and poems at the high end of grades VI to VIII text complexity band independently and proficiently.

Reading		
Suggested areas/Content	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ▷ Literary/ non-literary texts on a wide range of themes covering different genres and registers. The themes may include: <ul style="list-style-type: none"> ☛ <i>Self, Family, Home, Friends etc.</i> ☛ <i>Neighbourhood and Community.</i> ☛ <i>The Nation – diversity (socio-cultural, religious and ethnic, as well as linguistic), heritage</i> ☛ <i>Myths/legends/folktales</i> ☛ <i>The World – India’s neighbours and other countries (their cultures, literature and customs)</i> ☛ <i>Adventure and Imagination</i> ☛ <i>Sports and Yoga</i> ☛ <i>Issues relating to Adolescence</i> ☛ <i>Science and Technology</i> ☛ <i>Peace and Harmony</i> ☛ <i>Travel and Tourism</i> ☛ <i>Mass Media</i> ☛ <i>Art and Culture</i> ☛ <i>Health and Sanitation.</i> 	<ul style="list-style-type: none"> ▷ Reviewing and building on previous learning ▷ Providing texts (different genres and forms) to comprehend, infer and evaluate from various aspects. ▷ Encouraging children to identify and use ideas and views drawn from the text to evaluate, support and to present one’s own point of view. ▷ Providing texts and creating opportunities for reading and analysing details (e.g. dialogue and incidents) to comprehend the storyline and infer character traits. ▷ Introducing children to elements of suspense and 	<ul style="list-style-type: none"> ▷ Magazines, newspapers ▷ Activities for relating ideas of the text with their lives. ▷ Text types: Very short stories, poems and songs, texts with visuals, etc. Age appropriate magazines, newspapers, picture books, story books etc. for reading and connect it to their own experiences. ▷ Posters/ Charts etc. to stimulate language. ▷ Group/ pair work ▷ Build a class library

- ☛ *Famous Personalities & achievers,*
- ☛ *Environmental concerns – water conservation, cleanliness and sanitation, Safety –personal safety & awareness about child abuse, conservation energy, sustainable development.*

- ▷ Extensive and intensive reading of the texts for comprehension, inference etc.
- ▷ Focus on choice of vocabulary/figurative language and tone/mood used in the text.
- ▷ Deconstruct the textual piece to understand the
 - ▷ central theme
 - ▷ point of view
 - ▷ character
 - ▷ plot
 - ▷ dialogue / incident
 - ▷ structure
 - ▷ suspense
 - ▷ humour
 - ▷ points of view
- ▷ Evaluate and analyse the text from the point of view of its
 - ▷ production
 - ▷ drama
 - ▷ Film content.

humour by reading aloud some examples of such kinds of writing.

- ▷ Facilitating the critical appreciation of books/ films based on books by encouraging children to read and critically appreciate the text as well as watch the film based on the book.
- ▷ Encouraging children to establish links/ make comparisons between themes, characters, patterns of events in modern writing and traditional characters, myths and legends.

Writing

Children write coherently and logically defend their writings through active research. There is a continuum in their creative writing.

Learning Outcomes:

Children will be able to:

- ✓ **develop** different styles of writing as per the genre/ form with a sense of audience;
- ✓ relate and connect ideas/ concepts; selects appropriate introductory strategies, develop logical arguments, gives examples and use appropriate quotations to support arguments;
- ✓ **connect** relevant ideas and formulates appropriate conclusions;
- ✓ **focus** on the use of grade appropriate vocabulary, using precise phrases, sensory language to make the writing vivid and vibrant;
- ✓ work on short projects individually and in groups for collaborative work and help foster greater interaction among students;
- ✓ **develop** age appropriate skills of writing across disciplines;
- ✓ use technology as a resource to enhance research work;
- ✓ draw from personal experience or real life situations;
- ✓ take a stand / debate on argumentative topics and logically defend his/her point of view;
- ✓ demonstrate the ability to use words and phrases to the grade appropriate level, including those that convey emotions, actions, etc.

Creative writing

- ✓ **write** narratives that recount a well-elaborated event or short sequence of events; includes details to describe actions, thoughts, and feelings;
- ✓ **write creative pieces** such as story, poems, travelogues, features, etc.;
- ✓ **prepare** advertisements/posters/ notices etc. on various topics;
- ✓ write formal/informal letters using the prescribed format;
- ✓ **write** four or more paragraphs of about 250 - 300 words at a more advanced level on any given topic;
- ✓ **produce** original compositions (prose/ poetry) that are imaginative/ descriptive/ narrative/ argumentative, anecdotal;
- ✓ Adopt the process approach to writing by planning, writing, revising, editing, and rewriting.

Reading and Writing

Suggested areas/Content	Suggested Transactional Processes	Suggested Learning Resources
<p>Write a:</p> <ul style="list-style-type: none"> ➤ Paragraph (250 -300 words) ➤ Letter (formal, informal) ➤ Advertisement ➤ Diary ➤ Journal ➤ Notice ➤ Poster ➤ Articles ➤ Report ➤ Personal narrative ➤ Anecdote ➤ Story ➤ poem ➤ feature ➤ dialogues ➤ Write across disciplines. ➤ Use of technology as a resource to enhance research work. ➤ process approach to writing by planning, writing, revising, editing, and rewriting 	<ul style="list-style-type: none"> ➤ Reviewing and building on previous learning ➤ Providing contexts/ situations from within the range of the learner's experience (example- letters to Principal, Teacher, Editor, Librarian etc.) ➤ Creating situations for children to follow the five step process to writing. ➤ Facilitating the writing process through class level discussions/or by providing a wide range of writing prompts (including a picture, object/s or a set of words E.g. giving the opening or closing lines of a story and instructing the learner to write an original short story that incorporates the given lines). ➤ Creating an environment for children to expand their vocabulary to be utilized in their written compositions. (e.g. through 'word mapping' / brainstorming) ➤ Providing opportunities for children to correctly identify the elements of a short story (plot, character, setting etc.) and incorporate them into their own writing styles. ➤ Creating opportunities for children to express their own personal opinion/ respond to a debatable topic at class level discussions/ debates (E.g. Imagination, not information is responsible for human progress.) Encouraging children to base their arguments on reason and logic rather than sentiment. ➤ Providing rubrics / checklists to revise and edit written material 	<ul style="list-style-type: none"> ➤ Age appropriate Tasks/activities / Flashcards/ Posters/ Charts etc. to stimulate language. ➤ Newspaper/ magazines/ articles/ pictures/ advertisement etc. ➤ Group/ pair work

Grammar and Vocabulary in Context

Children develop a rational outlook to the different functions of grammar and use it accordingly in diverse context that may include e- content.

Learning Outcomes:

Children will be able to:

- ☑ **identify** and understand the difference between phrases and clauses and their function in specific sentences;
- ☑ **analyse** a given sentence and identify the main clause and classify the subordinate clause (s);
- ☑ **transform** sentences from simple to complex /compound sentences;
- ☑ use vocabulary for different registers as per the context;
- ☑ adopt technology including the internet, to produce and present relationships between information and ideas efficiently as well as to interact and collaborate with others;
- ☑ **assess** and acknowledge information from print and digital sources.

Grammar and Vocabulary in Context

Suggested areas/Content	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Phrases and clauses and their function in specific sentences. ➤ Sentenced Analysis: ➤ main clause and subordinate clause (s). ➤ Sentence transformation from simple to complex /compound sentences. ➤ Use phrases, idioms figure of speech in context. 	<ul style="list-style-type: none"> ➤ Reviewing and building on previous learning ➤ Providing examples of grammar in context to make children understand the various aspects of grammar. ➤ Creating tasks and activities for children to use grammar in the related context. ➤ Using audio visual aids and verbal clues to reinforce the use of grammar and develop language skills. ➤ Providing a variety of contexts for children to be able to use vocabulary in context. 	<ul style="list-style-type: none"> ➤ Self / teacher created materials e.g. contextual tasks, activities on grammar in context. ➤ Audio, video, print / text / tactile form ➤ Authentic tasks and activities of short duration which would bring Vocabulary in context in an engagement with <ul style="list-style-type: none"> ☛ <i>words,</i> ☛ <i>word chunks,</i> ☛ <i>formulaic use</i> ☛ <i>collocations</i> ☛ <i>expressions in dialogue.</i> ☛ <i>Word / Languages games.</i> ➤ Posters / Charts to stimulate language. ➤ Newspapers articles

ENGLISH LITERATURE

Literature encompasses both literary and non-literary writings. Literary writing is an expression of life through the medium of language that is aesthetically pleasing. Literature makes us think about ourselves and our society, allows us to enjoy language and beauty. It helps us appreciate life in its myriad colours along with language learning. Children get exposure to rich use of language through carefully structured sentences and words. Different forms of literature such as prose, poetry, and drama use rhyme, rhythm, alliteration, irony, dialogue and a number of other devices that help develop appreciation and language. These forms of literature introduce children to a range of writings such as story, bio/autobiography, letter, poetic drama, different genres of poetry etc. In literary writing, imagination plays the most important role that would help develop creative expression, sensitization to local and global issues. Non-literary texts such as reports, articles etc. provide academic information thereby enriching the repertoire of children.

Suggested Reading List

Classes VI & VII

- Novels by Gerard Durrell
- Malgudi Days - R.K. Narayan
- I am Malala – Malala Yousafzai
- Detective stories – Agatha Christie
- The Lost World – Sir Arthur Conan Doyle
- The Happy Prince and Other Tales – Oscar Wilde
- Animal Farm – George Orwell
- Tuck Everlasting – Natalie Babbitt
- Short Stories (O’ Henry/ Saki/ Leo Tolstoy/Rudyard Kipling/ Guy De Maupassant/Mark Twain/ Oscar Wilde/Jorge Luis Borges/William Faulkner/Anton Chekhov/ Edgar Allen Poe/Franz Kafka/Earnest Hemingway /Flannery O’Connor/James Joyce/Ray Bradbury/Roald Dahl/ Nicolai Gogol and Translations from Indian writers like Tagore, Premchand etc.)
- Something Out of nothing
- Marie Curie and Radium – Carl Killough
- Ignited minds – APJ Kalam
- Graphic Novels: Tin Tin Series/ Asterix series

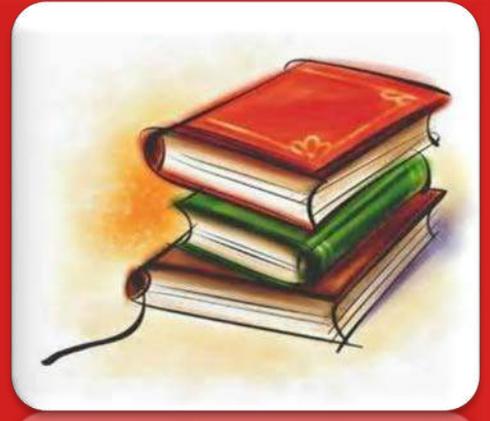
Class VIII

- Lord of the Flies – William Golding
- A Wizard of Earth Sea – Ursula Le Guin
- The Hobbit – J.R.R. Tolkien
- Watership Down – Richard Adams
- To Kill a Mockingbird – Harper Lee
- The Boy in the Striped Pyjamas – John Boyne
- A tale of Two Cities – Charles Dickens
- Les Miserables – Victor Hugo (Abridged)
- Sherlock Holmes – Sir Arthur Conan Doyle
- The Old Man and the Sea – Ernest Hemingway
- The Pearl– John Steinbeck
- P.G. Wodehouse (Jeeves/ Blandings Castle etc.)
- The Ramayana/ Mahabharata – C. Rajagopalachari
- Graphic Novels (e.g. Maus – Art Spiegelman)
- David Copperfield - Charles Dickens

The above list is only recommended reading - Teachers are welcome to exercise flexibility in an age appropriate selection of books that may include traditional and contemporary authors.

HINDI

हिंदी



परारंभिक स्तर पर हिंदी भाषा अधिगम (द्वितीय भाषा)

किसी भी शिक्षा व्यवस्था में भाषा-शिक्षण का महत्वपूर्ण स्थान होता है। विभिन्न विषयों के सार्थक अधिगम के साथ-साथ बच्चों के वैयक्तिक, संज्ञानात्मक और सामाजिक विकास के लिए भाषा बहुत महत्वपूर्ण होती है। भाषा की शिक्षा बच्चों में मूल्यों का विकास करती है और उनकी स्वाभाविक सृजनात्मकता एवं कल्पना का पोषण करती है। भाषा विकास से बच्चों में स्वतंत्र चिंतन, मत प्रकाशन और घटनाओं के तार्किक विश्लेषण की योग्यता उत्पन्न होती है। भाषा किसी भी बच्चे के पास, किसी भी समय पर, ज्ञान का सबसे समृद्ध स्रोत भी होती है।

भारत एक बहुभाषी देश है जिसमें बहुत-सी क्षेत्रीय भाषाएँ रची-बसी हैं। यँ तो भारत की सभी भाषाएँ समान रूप से महत्वपूर्ण हैं और देश के सभी नागरिकों को उनका सम्मान करना चाहिए, किंतु हिंदी की स्थिति सर्वथा भिन्न है। हिंदी को भारतीय संविधान के अनुसार भारत संघ की राजभाषा का दर्जा दिया गया है। यही नहीं, जनसंचार के माध्यमों समाचार पत्र, सिनेमा, प्रोद्योगिकी, रेडियो, टेलीविजन आदि द्वारा प्रचार-प्रसार से आज हिंदी बड़ी तीव्र गति से संपर्कभाषा के रूप में विकसित हो रही है और देश की सार्वजनिक भाषा बनती जा रही है, अतः प्राथमिक स्तर पर अंग्रेजी भाषा या क्षेत्रीय भाषा के प्रथम भाषा के रूप में सिखाए जाने के साथ-साथ हिंदी भाषा का द्वितीय भाषा के रूप में सिखाना महती आवश्यकता बन गया है। कक्षा एक से ही द्वितीय भाषा के रूप में हिंदी शिक्षण अधिगम प्रारंभ किया जाए ताकि पूरे भारत में परस्पर संवाद और संचार के रास्ते खुलें।

उच्च प्राथमिक स्तर पर हिंदी (द्वितीय भाषा) शिक्षण-अधिगम के उद्देश्य

उच्च प्राथमिक स्तर पर हिंदी भाषा के शिक्षण-अधिगम का मुख्य केंद्र बिंदु भाषा की विभिन्न दक्षताओं और कौशलों के उत्तरोत्तर विकास एवं संवर्धन के साथ-साथ बच्चों में साहित्य के प्रति रुचि उत्पन्न करना और उन्हें साहित्य के क्षेत्रों से परिचित करना है ताकि वे एक उत्सुक और जिज्ञासु पाठक बनें और उनमें सृजनशीलता का विकास हो।

कक्षा 6 – 8

उच्च प्राथमिक स्तर पर हिंदी शिक्षण अधिगम के उद्देश्य हैं –

- दैनिक जीवन में हिंदी में समझने-बोलने के साथ-साथ लिखने / सृजनात्मकता का विकास करना।
- विभिन्न संदर्भों में प्रयुक्त होने वाली शब्दावली का विकास करना।
- बाल साहित्य, समाचार पत्र व पत्रिकाओं को पढ़कर समझ जाना और उसका आनंद उठाने की योग्यता का विकास करना।
- औपचारिक विषयों और संदर्भों में बातचीत में भाग ले पाने की क्षमता का विकास करना।

- हिंदी भाषा में अपने अनुभव संसार को लिखकर सहज अभिव्यक्ति की क्षमता विकसित करना ।
- संचार के विभिन्न माध्यमों (प्रिंट और इलेक्ट्रॉनिक) में प्रयुक्त हिंदी के विभिन्न रूपों को समझने की योग्यता का विकास करना ।
- कक्षा में बहुभाषिक, बहुसांस्कृतिक संदर्भों के प्रति संवेदनशील सकारात्मक सोच बनाना ।
- अपनी मातृभाषा और परिवेशगत भाषा को साथ रखकर हिंदी की संरचनाओं की समझ बनाना और मौखिक तथा लिखित अभिव्यक्ति में व्याकरण सम्मत भाषा का प्रयोग करना ।
- साहित्य के विविध रूपों से परिचित होना ।

हिंदी भाषा के विषय / क्षेत्र

यह पाठ्य चर्चा हिंदी भाषा सीखने-सिखाने के 'समग्र भाषा पद्धति' के दृष्टिकोण पर आधारित है। यह पाठ्य चर्चा अनुशांसा करती है कि हिंदी शिक्षण अधिगम का दायरा इतना विस्तृत, व्यापक एवं वैविध्यपूर्ण हो कि बच्चे हिंदी के व्यापक और विविध स्वरूप के प्रति गहरी समझ बना सकें।

हिंदी शिक्षण अधिगम केवल भाषा की कक्षा तक ही सीमित नहीं होता। किसी भी विषय को सीखने का मतलब है उसकी अवधारणाओं को सीखना, उसकी शब्दावली को सीखना, उसके बारे में आलोचनात्मक ढंग से चर्चा करना और उसके बारे में लिखना। अतः हिंदी शिक्षण अधिगम एकांगी न हो अपितु अन्य पाठ्य चर्चक विषयों से सह संबंध बनाते हुए भाषा का विकास करने वाला हो। इसके लिए बच्चे भिन्न-भिन्न विषयों की पुस्तकों का अध्ययन करें।

हिंदी कक्षा में समसामयिक विषयों, मुद्दों व सरोकारों जैसे पर्यावरणीय चिंता, संसाधनों का संरक्षण, प्राणी जगत व वनस्पति जगत की सुरक्षा व संरक्षण, मानव अधिकार आदि को पाठ्यचर्चा में सम्मिलित किया जाना आवश्यक है। घर-परिवार, मित्र, पड़ोसी, पर्यावरण, पशु-पक्षी, पेड़-पौधे, कलाएँ, खेल, त्योहार आदि कुछ सुझावित विषय हैं जिनसे संबंधित पठन सामग्री उपलब्ध कराई जा सकती है। पाठ्य सामग्री में हिंदी से इतर भाषाओं की हिंदी में अनूदित रचनाओं का भी समावेशन हो जिससे बच्चों को अनुवाद की दुनिया में पाँव पसारती हिंदी के स्वरूप का रसास्वादन करवाया जा सके। पाठ्य-सामग्री बच्चों के मानसिक स्तर रुचियों और अनुभवों के अनुकूल होनी आवश्यक है। इसके अतिरिक्त लोककथाएँ, काल्पनिक व पौराणिक कथाएँ, परी कथाएँ भी पाठ्य सामग्री में समाविष्ट हो ताकि बच्चे देश की सामाजिक – सांस्कृतिक व भाषिक विरासत का आनंद ले सकें।

अन्य विषयों के साथ भाषा शिक्षण का समन्वय



मूल्य और जीवन कौशल

- हिंदी शिक्षण में वे तत्व अवश्य निहित होने चाहिए जो आवश्यक मूल्यों का पूर्ण रूप से संचार करें। मूल्यों की शिक्षा किसी विषय के रूप में पढ़ाकर या उपदेश देकर नहीं दी जा सकती। बल्कि पठन सामग्री और कक्षा के क्रियाकलाप इस प्रकार नियोजित होने चाहिए कि सच्चाई, ईमानदारी, संवेदनशीलता, सहायता, सहयोग, कल्याण भावना, सेवा, कार्य ही पूजा है जैसे मूल्य निष्पादित हो सकें। उपयुक्त विषयों, कथानकों और जीवनियों पर आधारित सांस्कृतिक कार्यक्रम और नाटकों का आयोजन किया जाए। मानव जाति के साथ-साथ अन्य प्राणियों और प्रकृति की सेवा का दृष्टिकोण विकसित हो जिसके लिए सभी शिक्षकों को अपने व्यवहार से ही आदर्श प्रस्तुत करना होगा।
- शिक्षा का वास्तविक उद्देश्य बच्चों को जीवन की चुनौतियों का सामना करने के लिए तैयार करना है। इसके लिए जरूरी है कि शिक्षा विभिन्न जीवन कौशलों से जुड़ी हो। जीवन कौशल जैसे- समस्या निवारण, आलोचनात्मक सोच, संप्रेषण, आत्म चेतना, तनाव से विचलित न होना, निर्णय लेना और सहानुभूति आदि सफल जीवन जीने तथा एक जिम्मेदार नागरिक बनने के लिए / बहुत ही महत्वपूर्ण हैं। भाषिक खेलों, गतिविधियों और क्रिया कलापों के द्वारा बच्चों को जीवन कौशलों को विकसित करने का अवसर मिलता है।

शिक्षण अधिगम प्रक्रिया

द्वितीय भाषा के रूप में पढ़ाई जा रही हिंदी भाषा का स्तर पढ़ने और पढ़ाने दोनों ही दृष्टियों से मातृ भाषा सीखने की तुलना में कुछ धीमी गति से चलेगा। यह गति धीरे-धीरे बढ़ सके, इसके लिए शिक्षकों को धैर्यपूर्वक शिक्षण अधिगम प्रक्रिया के कार्यक्रम को नियोजित करना होगा।

- किसी भी द्वितीय भाषा में निपुणता प्राप्त करने-कराने के लिए आवश्यक है कि बच्चों की सहजात भाषिक क्षमता तथा उनके अनुभवों का भरपूर उपयोग किया जाए। बच्चों को स्वतंत्र अभिव्यक्ति के अधिक-से-अधिक अवसर दिए जाएँ। मौखिक भाषिक अभ्यास के लिए परस्पर बातचीत, कहानी सुनना- सुनाना, घटना वर्णन, चित्र वर्णन, संवाद, वाद-विवाद, अभिनय, भाषण, आशुभाषण, कविता पाठ और अंत्याक्षरी जैसी गतिविधियों का सहारा लिया जाए।
- निवेश समृद्ध संप्रेषण का वातावरण भाषा अधिगम की आवश्यक शर्त है। निवेश के अंतर्गत आते हैं – पाठ्य पुस्तकें, बच्चों द्वारा चुने गए पाठ और कक्षा पुस्तकालय जिसमें अनेक विधाओं के लिए जगह हो, मुद्रित सामग्री, मीडिया सामग्री (पत्र-पत्रिकाएँ, समाचार पत्रों के स्तंभ, रेडियो, ऑडियो कैसेट और प्रामाणिक सामग्री)।
- वृत्तचित्रों और फ़ीचर फ़िल्मों को भाषा सीखने की सामग्री के तौर पर प्रयोग करने की आवश्यकता है। इनके माध्यम से भाषा के प्रयोग की विशिष्टता की पहचान कराई जा सकती है और अलग-अलग हिंदी की छटा दिखाई जा सकती है।
- भाषा व्यवहार से सीखी जाती है। शिक्षक स्वयं शब्दकोश, साहित्यकोश और संदर्भ ग्रंथों के प्रयोग का प्रदर्शन करें। इससे बच्चे भी प्रेरित होंगे और अनुमान के आधार पर निकटतम अर्थ तक पहुँचकर ही संतुष्ट नहीं होंगे बल्कि अधिक अर्थ खोजने का प्रयास करेंगे। वे शब्दों के अर्थ में बारीक अंतरों को समझेंगे और उसी के अनुरूप अपनी भाषा में प्रयोग करेंगे।
- चुनौती पूर्ण और विशेष आवश्यकता वाले बच्चों की भाषा-शिक्षण संबंधी आवश्यकताओं को समझकर पाठ्यचर्या अनुकूलन किया जाए। सीखने-सिखाने की प्रक्रियाओं में उनकी सहभागिता को समान रूप से प्रोत्साहित किया जाए।
- कक्षा में हर प्रकार की विभिन्नताओं के प्रति सकारात्मक और संवेदनशील वातावरण निर्मित किया जाए।
- कक्षा में बच्चों द्वारा किए गए प्रयासों को सराहा जाए और उनके रचनात्मक / सृजनात्मक कार्यों को प्रदर्शित किया जाए।

थीम 1: सुनना और बोलना

बच्चों की भाषा धीरे-धीरे परिपक्वता की ओर बढ़ने लगती है। गोष्ठियों, परिचर्चा, उद्घोषणा आदि को सुनकर तुरंत समझकर प्रतिक्रिया देते हैं। विशिष्ट संदर्भों में प्रयुक्त शब्दावली, मुहावरे-लोकोक्तियों का अर्थ समझने लगते हैं। अपनी बात आत्मविश्वास के साथ सटीक शब्दों में कहते हैं। बोलने में प्रवाह और उतार-चढ़ाव होता है।

अधिगम उपलब्धियाँ (Learning outcomes):

- ✓ टीवी पर प्रसारित चर्चा, संगोष्ठी, सोशल मीडिया और इंटरनेट की दृश्य-श्रव्य सामग्री को सुनकर भली-भाँति समझ सकेंगे और आवश्यकता अनुरूप अपनी प्रतिक्रिया प्रकट कर सकेंगे। अपने विचारों का विस्तार करते हैं।
- ✓ पढ़ी, सुनी या देखी बातों जैसे – सामाजिक घटनाओं, कार्यक्रमों, मुद्दों, सामाजिक सरोकारों आदि पर अपनी व्यक्तिगत राय बना सकेंगे। बेझिझक चर्चा कर सकेंगे और प्रश्न उठा पाएंगे।
- ✓ रेडियो, टीवी, आदि पर सुनी-देखी खबरों को अपनी भाषा में अभिव्यक्त कर सकेंगे।
- ✓ विविध कलाओं, जैसे – हस्तकला, वास्तुकला, नृत्य कला आदि में प्रयुक्त भाषा को समझ सकेंगे और अपनी भाषा में इस प्रकार की शब्दावली का प्रयोग कर सकेंगे।
- ✓ वक्ता की बात को आलोचनात्मक दृष्टि से सुनेंगे और समझ सकेंगे।
- ✓ परस्पर चर्चा करते समय दूसरे के विचार से असहमत होने पर भी धैर्यपूर्वक सुनेंगे और पूर्ण शिष्टाचार का परिचय देते हुए उसके विचार समझ सकेंगे और अपने विचार कह सकेंगे।
- ✓ प्रश्नों को सुनकर समझ सकेंगे और उनके उपयुक्त उत्तर दे सकेंगे।
- ✓ अलग-अलग संदर्भों में प्रयुक्त भाषा-शैली को समझते हुए उसका आनंद ले सकेंगे और अपनी भाषा में अपेक्षित शैली को प्रयुक्त कर सकेंगे।
- ✓ साहित्यिक विधाएँ – कहानी, कविता, नाटक आदि का सुनकर-देखकर उसका आनंद ले सकेंगे।
- ✓ लिंग/ वचन को ध्यान में रखकर अपनी बात कह सकेंगे।
- ✓ मल्टी-मीडिया (ग्राफ़िक्स, तस्वीरें, संगीत, ध्वनि आदि) का प्रयोग करते समय दृश्य – सामग्री की प्रस्तुति प्रवाहपूर्ण भाषा में आत्मविश्वास से कर सकेंगे।
- ✓ प्रभावशाली ढंग से वाक् प्रस्तुति (भाषण, वाद-विवाद, कहानी कहना, आशुभाषण आदि) कर सकेंगे।
- ✓ उनके विचारों को चुनौती दिए जाने पर भी अपने व्यवहार में ठहराव के साथ अपनी राय दे सकेंगे।

सुनना और बोलना

सुझावित विषय / क्षेत्र	सुझावित शिक्षण-अधिगम प्रक्रिया	सुझावित अधिगम स्रोत
<ul style="list-style-type: none"> ➤ पाठ्य – सामग्री एवं अन्य अपठित सामग्री पर विविध प्रकार के प्रश्न ➤ परिचर्चा के विषय (बाल श्रम, मच्छरों का कहर, लोकतंत्र, अभिव्यक्ति की स्वतंत्रता) 	<ul style="list-style-type: none"> ➤ ऑडियो सुनवाएँ और प्रश्न पूछें। विविध विधाओं की सामग्री सुनवाने के लिए विविध परिस्थितियाँ / अवसर प्रदान करें। ➤ अतिथियों को आमंत्रित कर उनके वक्तव्य सुनने के अवसर दें, मल्टीमीडिया सामग्री सुनाकर – दिखाकर विद्यार्थियों को अपनी 	<ul style="list-style-type: none"> ➤ आमंत्रित अतिथियों के भाषण व वक्तव्य ➤ विविध प्रकार की ऑडियो / वीडियो सामग्री ➤ साहित्यिक लेख (अखबार, पत्रिकाओं से)

सुनना और बोलना

सुझावित विषय / क्षेत्र	सुझावित शिक्षण-अधिगम प्रक्रिया	सुझावित अधिगम स्रोत
<ul style="list-style-type: none"> ➤ अपनी कक्षा के स्तर की शब्दावली ➤ पी.पी.टी. या वीडियो द्वारा प्रस्तुत दृश्य सामग्री ➤ सूचनाएँ, जानकारियाँ, विभिन्न प्रकार की तालिकाएँ ➤ विभिन्न संदर्भों : सामाजिक, सांस्कृतिक, ऐतिहासिक, राजनीतिक आदि की भाषा ➤ समाचार-पत्र, टीवी, विज्ञापन आदि की भाषा ➤ परिचर्चा, भाषण, वाद-विवाद, कहानी आदि में प्रयुक्त भाषा ➤ मल्टी-मीडिया का प्रयोग करते समय विभिन्न अंगों (जैसे ग्राफ़िक्स, तस्वीरें, संगीत, ध्वनि आदि) का दृश्य सामग्री में प्रस्तुति <ul style="list-style-type: none"> ➤ विषय : किसी वाद्ययंत्र पर ➤ ऐतिहासिक इमारत ➤ ऐतिहासिक स्थल ➤ किसी प्रदर्शनी पर ➤ किसी आपदा पर ➤ सभा या सामूहिक चर्चा बिंदुओं की प्रस्तुति ➤ संयोजक (Facilitator) की आलोचनात्मक टिप्पणियाँ ➤ अपने मित्रों और अपने विचारों में तालमेल बिठाना ➤ नियोजित मौखिक प्रस्तुति करना, उद्घोषणा करना आदि 	<p>प्रतिक्रिया देने के अवसर दें। वाक्, वाद-विवाद और आशुभाषण के अवसर प्रदान करें। जब मैं पहली बार मंच पर गई, जब मित्र से अनबन हो गई, परीक्षाओं की आवश्यकता आदि।</p> <ul style="list-style-type: none"> ➤ श्रुतभाव-ग्रहण के लिए अलग-अलग अभ्यास (बहुवैकल्पिक प्रश्न, सही-गलत वाले प्रश्न, कथ्य सुनते हुए तालिका भरना, चित्र भरना आदि) करवाएँ। ➤ सक्रिय और जागरूक बनाने वाली रचनाएँ, अखबार के लेख, फिल्म, ऑडियो वीडियो सामग्री को देखने, सुनने और समझने के अवसर प्रदान करें। ➤ अपने परिवेश, समय और समाज से जुड़े विषयों पर रचनाएँ, पत्र-पत्रिकाएँ उपलब्ध करवाएँ। ➤ कल्पनाशीलता और सृजनशीलता को विकसित करने वाली गतिविधियों जैसे – अभिनय, रोल-प्ले, कविता – पाठ, वाक् प्रस्तुति, परिचर्चा आदि के आयोजन करें। ➤ साहित्य और साहित्यिक तत्वों की समझ बढ़ाने के अवसर दें। ➤ बारी-बारी से बच्चों को 'एंकर' बनने के अवसर दें। ➤ मल्टी-मीडिया का प्रयोग करते हुए परियोजना कार्य करवाएँ। 	<ul style="list-style-type: none"> ➤ पुस्तकालय में प्रासंगिक और तात्कालिक / समसामयिक पुस्तकें ➤ नेट सुविधा / मल्टीमीडिया ➤ श्रुतभाव- ग्रहण सामग्री

श्रीम २: पढ़ना एवं लिखना (पठन एवं लेखन कौशल)

बच्चे पाठ्य-पुस्तक से इतर अन्य पुस्तकें, समाचार-पत्र, पत्रिकाएँ पढ़कर समझ बनाते हैं और आनंद लेते हैं। तरह-तरह के कोशों को अपनी भाषिक क्षमता के संबद्धन के लिए प्रयोग में लाते हैं। सभी विधाएँ – कविता, कहानी, नाटक, यात्रा-विवरण, रिपोर्ट, संस्मरण, लेख आदि में रचनात्मक लेखन करते हैं। लेखन में व्याकरण सम्मत भाषा का प्रयोग करते हैं। उनके लेखन में परिपक्व भाषा की झलक मिलती है।

अधिगम उपलब्धियाँ (Learning outcomes):

- ✓ अखबार, पुस्तकें, पत्रिकाओं आदि में सामाजिक घटनाओं, मुद्दों, सरोकारों को पढ़कर समझ सकेंगे और उनपर अपने विचार लिखकर प्रस्तुत कर सकेंगे।
- ✓ पाठ्य-सामग्री पढ़कर उसका केंद्रीय भाव समझ सकेंगे और समसामयिक संदर्भों में उसे जोड़कर देख सकेंगे। उसकी प्रासंगिकता पर अपने विचार लिख सकेंगे।
- ✓ हिंदी भाषा में विभिन्न प्रकार की उपलब्ध सामग्री (समाचार, पत्र-पत्रिकाएँ, कहानी, जानकारी परक सामग्री, इंटरनेट पर प्रकाशित सामग्री आदि) को समझकर पढ़ सकेंगे और उस पर अपनी आलोचनात्मक प्रतिक्रिया लिख सकेंगे।
- ✓ लिखते समय क्रमबद्धता, संक्षिप्तता एवं प्रकरण की एकता बनाए रख सकेंगे।
- ✓ शब्दकोष में अर्थ की जानकारी के साथ-साथ अन्य जानकारी को भी अपनी भाषा / लेखन में प्रयुक्त कर सकेंगे।
- ✓ काव्य-रचना के अर्थ को विस्तार दे सकेंगे।
- ✓ संक्षिप्त में कहे गए विचार को विस्तार से लिख सकेंगे और विस्तृत सामग्री को संक्षिप्त में लिख सकेंगे।
- ✓ लेखक के विचारों को उसकी दृष्टि से पढ़कर समझ सकेंगे।
- ✓ विभिन्न शब्दों, पदबंधों आदि को विभिन्न संदर्भों के अनुसार समझेंगे और अपने लेखन में उसका प्रयोग कर सकेंगे।
- ✓ अपने वक्तव्य को तर्कपूर्ण, प्रभावपूर्ण ढंग से और उदाहरण देकर लिख सकेंगे।
- ✓ विभिन्न प्रिंट और डिजिटल माध्यमों से जानकारी प्राप्त करके अपने लेखन में उसका उपयोग कर सकेंगे।
- ✓ व्याकरण सम्मत भाषा में विद्यालयी पत्रिका के लिए लेख, कहानी, कविता, नाटक आदि लिख सकेंगे।
- ✓ किसी भी रचना को दूसरी विधा में रूपांतरित कर सकेंगे।
- ✓ अलग-अलग तरह के प्रश्न पढ़कर उनके अनुरूप उत्तर लिख सकेंगे।

पढ़ना एवं लिखना

सुझावित विषय / क्षेत्र	सुझावित शिक्षण-अधिगम प्रक्रिया	सुझावित अधिगम स्रोत
<ul style="list-style-type: none"> ▶ पाठ्य सामग्री और अपठित सामग्री एवं उस पर प्रश्न 	<ul style="list-style-type: none"> ▶ विभिन्न विधाओं की रचनाओं जैसे – कविता, कहानी, एकांकी आदि को भावपूर्ण ढंग से पढ़वाएँ। 	<ul style="list-style-type: none"> ▶ साहित्यिक - सामग्री के लिए पुस्तकें और पत्रिकाएँ
<ul style="list-style-type: none"> ▶ पाठ्य सामग्री के केंद्रीय भाव का अनुमान एवं लेखन 	<ul style="list-style-type: none"> ▶ विद्यार्थियों को ऐसे अवसर प्रदान करें जिसमें वे विभिन्न विधाओं को उपयुक्त शैली में पढ़ सकें और लिख सकें। 	<ul style="list-style-type: none"> ▶ प्रासंगिक, तात्कालिक / समसामयिक पुस्तकें / पत्रिकाएँ
<ul style="list-style-type: none"> ▶ अपने ज्ञान के आधार पर विविध विधाओं की समझ 	<ul style="list-style-type: none"> ▶ ऐसे प्रश्नों पर चर्चा करें और उनके उत्तर लिखवाएँ, जिनमें बच्चे अपनी पठित सामग्री को अन्य आयामों से जोड़कर देख-समझ सकें। 	<ul style="list-style-type: none"> ▶ नेटसुविधा/ मल्टीमीडिया ▶ भाषा – खेल
	<ul style="list-style-type: none"> ▶ विभिन्न विधाओं को परस्पर रूपांतरित करने के अवसर 	

पढ़ना एवं लिखना

सुझावित विषय / क्षेत्र	सुझावित शिक्षण-अधिगम प्रक्रिया	सुझावित अधिगम स्रोत
<ul style="list-style-type: none"> ➤ अपनी व्यक्तिगत राय से भिन्न पाठ्य-सामग्री के मूलभूत तथ्यों की पहचान ➤ पाठ्य सामग्री की तुलना में भाव साम्य की दृष्टि से अन्य रचनाएँ ➤ साहित्यिक एवं सांस्कृतिक संदर्भों के अनुरूप शब्दों, मुहावरों, पदबंधों का चयन एवं प्रयोग ➤ पाठ्य सामग्री को टुकड़ों में बाँटकर अपनी समझ का संवर्द्धन ➤ सत्य, काल्पनिक अनुभवों का विस्तार से और क्रमबद्धता से लेखन ➤ उपयुक्त कार्यकारण संबंध और श्रोताओं के अनुरूप लेखन ➤ विभिन्न प्रिंट एवं डिजिटल माध्यमों से प्राप्त उपयुक्त जानकारी ➤ व्यंग्य, रूपक, उपमा आदि की समझ ➤ वर्ष के अंत तक साहित्य की विभिन्न विधाएँ, कहानी, एकांकी, कविता / निबंध, लेख आदि की समझ और लेखन 	<ul style="list-style-type: none"> प्रदान करें। ➤ सक्रिय और जागरूक बनाने के लिए समसामयिक लेख पढ़वाएँ और उन पर अपनी प्रतिक्रिया लिखने को कहें। ➤ कल्पनाशीलता और सृजनशीलता को विकसित करने के लिए अतिरिक्त अध्ययन के लिए प्रेरित करें और पुस्तकें उपलब्ध करवाएँ। ➤ अपने परिवेश, समय और समाज से जुड़े विषयों पर रचनाएँ उपलब्ध करवाएँ और लेखन के अवसर भी दें। ➤ पाठ्य सामग्री की तुलना में भाव साम्य की दृष्टि से उदाहरण देने को कहें और बच्चों को अपनी अपनी जानकारी साझा करने को प्रेरित करें। ➤ विभिन्न कोशों से बच्चों का परिचय करवाएँ और उन्हें देखने-समझने के अवसर दें। ➤ शब्दों / भाषा के इतिहास आदि की जानकारी प्राप्त करने के लिए बच्चों में रुचि पैदा करने का प्रयास करें। ➤ ऐसी गतिविधियों का आयोजन करवाएँ जिनमें पाठ्य-सामग्री को टुकड़ों में बाँटकर बच्चे अपनी-अपनी टिपण्णी दें। ➤ भाषा खेलों का आयोजन करें। ➤ सांस्कृतिक कार्यक्रमों के आयोजन में बच्चों को 'एंकर' की प्रस्तुति धन्यवाद ज्ञापन, अतिथि-परिचय, कार्यक्रम संचालन के लिए वक्तव्य आदि के लेखन के अवसर दें और उन्हें प्रस्तुत करने के अवसर दें। ➤ इस प्रकार की प्रस्तुति कक्षा में भी करवाएँ ताकि सभी बच्चों को मौका मिल सके। ➤ ऐसे परियोजना कार्य करवाएँ जिनमें बच्चे विभिन्न प्रिंट एवं डिजिटल माध्यमों की जानकारी का प्रयोग कर सकें। ➤ कविताएँ पढ़ाते समय व्यंग्य, रूपक, उपमा आदि की ओर संकेत करें और समझाएँ। 	<ul style="list-style-type: none"> ➤ लेखन- प्रतियोगिताएँ ➤ प्रपत्र ➤ विभिन्न कार्यक्रम ➤ तरह-तरह के कोश ➤ गतिविधियाँ

थीम 3: व्याकरण और भाषा

बच्चे भाषायी अनुप्रयोग समझने लगते हैं। भाषा की जटिल संरचनाओं को समझने लगते हैं। वे अपनी लिखित और मौखिक अभिव्यक्ति में व्याकरण सम्मत भाषा का प्रयोग करते हैं। पद-भेद, शब्द-भंडार, वाक्य-रचना की पहचान करते हैं। रचनात्मक लेखन में निबंध, पत्र, डायरी, रिपोर्ट, विज्ञापन, कहानी, नाटक आदि लिखते हैं।

अधिगम उपलब्धियाँ (Learning outcomes):

- ✓ हिंदी भाषा में प्रयुक्त शब्दावली और विभिन्न भाषा शैलियों को समझ सकेंगे और मौखिक तथा लिखित अभिव्यक्ति में उनका प्रयोग कर सकेंगे।
- ✓ विभिन्न भाषाओं और उनकी लिपियों की जानकारी प्राप्त कर सकेंगे।
- ✓ तत्सम- तद्भव रूपों को समझेंगे और अपनी भाषा में प्रयुक्त कर सकेंगे।
- ✓ उपसर्ग-प्रत्यय का तात्पर्य समझकर उन्हें शब्दों में जोड़कर नए अर्थ समझ सकेंगे। उनके जुड़ने से अर्थ-परिवर्तन को भी जान सकेंगे।
- ✓ संज्ञा के तीन भेद व्यक्तिवाचक संज्ञा, जातिवाचक संज्ञा और भाववाचक संज्ञा की पहचान और भाववाचक संज्ञाओं का निर्माण कर सकेंगे। व्यक्तिवाचक संज्ञा के जातिवाचक संज्ञा प्रयोग या इसके उलट संज्ञा प्रयोग समझेंगे और प्रयोग कर सकेंगे।
- ✓ सर्वनाम के भेदों - पुरुषवाचक सर्वनाम, निश्चयवाचक, अनिश्चयवाचक, प्रश्नवाचक, संबंधवाचक, निजवाचक की पहचान और उसका सही उनका सही प्रयोग कर सकेंगे। उनके रूपावली वर्ग पहचान सकेंगे।
- ✓ विशेषण के चार भेद – गुणवाचक विशेषण, परिमाणवाचक विशेषण, संख्यावाचक विशेषण, सार्वनामिक विशेषण समझेंगे और उनके लिंग / वचन के आधार पर सही प्रयोग कर सकेंगे। अन्य पदों से विशेषण बना सकेंगे।
- ✓ कर्म के आधार पर दो भेद - अकर्मक क्रिया और सकर्मक क्रिया की पहचान कर सकेंगे। क्रिया के अन्य भेद – प्रेरणार्थक, संयुक्त आदि की पहचान कर सकेंगे।
- ✓ कर्तृवाच्य, कर्मवाच्य और भाववाच्य की पहचान और उनका प्रयोग अपनी भाषा में कर सकेंगे। परस्पर रूपांतरण भी कर सकेंगे।
- ✓ अव्यय – क्रिया विशेषण, संबंधबोधक, समुच्चयबोधक, विस्मयादिबोधक, निपात - सब की पहचान और प्रयोग को समझ सकेंगे। क्रियाविशेषण के भेद (रीतिवाचक, परिमाणवाचक, कालवाचक, स्थानवाचक), समुच्चयबोधक के भेद (समानाधिकरण और व्याकरण) की पहचान भी कर सकेंगे।
- ✓ व्यावहारिक भाषा में लिंग और वचन का प्रयोग कर सकेंगे। वाक्यों में लिंग परिवर्तन और वचन परिवर्तन कर सकेंगे।
- ✓ काल के तीनों भेद – भूतकाल, वर्तमान काल और भविष्यत् काल का समुचित प्रयोग कर सकेंगे।
- ✓ लिखित और मौखिक भाषा में सही परसर्गों का प्रयोग कर सकेंगे।
- ✓ अर्थ के आधार पर वाक्य भेद की पहचान कर सकेंगे और परस्पर परिवर्तन भी कर सकेंगे। भेद – विधानवाचक, निषेधवाचक, प्रश्नवाचक, विस्मयादिबोधक, आज्ञावाचक, इच्छावाचक, संदेहवाचक और संकेतवाचक को पहचान सकेंगे। वाक्य शोधन भी कर सकेंगे।
- ✓ रचना के आधार पर भेद – सरल, संयुक्त, मिश्रित को पहचानेंगे और वाक्य परस्पर रूपांतरित कर सकेंगे। वाक्य के अंगों – उद्देश्य - विधेय को पहचान सकेंगे।
- ✓ विराम-चिह्नों का सही प्रयोग अपनी भाषा में कर सकेंगे। 'की' और 'कि' तथा 'रि' और 'ऋ' के अंतर की पहचान कर सकेंगे। अनुस्वार तथा 'र' के विभिन्न रूपों को ठीक से अपनी भाषा में प्रयुक्त कर सकेंगे।

- ❑ शब्दों के विभिन्न रूपों विलोम, पर्यायवाची, अनेक के लिए एक शब्द, समरूपी भिन्नार्थक शब्द, अनेकार्थी शब्दों को समझेंगे और इस तरह के नए शब्दों का प्रयोग अपनी भाषा में कर पाएँगे।
- ❑ महावरेदार भाषा समझ सकेंगे और अपने लेखन में उनका प्रयोग कर सकेंगे। **नए महावरों और लोकोक्तियों के प्रयोग भी समझेंगे।**
- ❑ अपठित अनुच्छेद समझ सकेंगे और अपनी भाषा में प्रश्नों के उत्तर लिख सकेंगे।
- ❑ औपचारिक और अनौपचारिक पत्रों का प्रारूप समझते हुए पत्र लेखन कर सकेंगे।
- ❑ निबंध-लेखन में उनकी भाषा, विचार, शैली में परिपक्वता की झलक दिख सकेगी।
- ❑ विज्ञापन लेखन – तीनों प्रकार (वर्गीकृत, जनहित में जारी और उत्पाद बिक्री हेतु) के विज्ञापनों के अंतर को समझेंगे और अलग-अलग विज्ञापन तैयार कर सकेंगे।
- ❑ डायरी के प्रारूप को समझते हुए विशेष दिन की डायरी लिख सकेंगे।
- ❑ **नोटिस – प्रारूप के अनुसार आवश्यकतानुसार नोटिस लिख सकेंगे।**
- ❑ **रिपोर्ट / प्रतिवेदन लेखन –** विद्यालय के विभिन्न कार्यक्रमों पर रिपोर्ट लिख सकेंगे।
- ❑ **सुर्खियाँ लेखन –** विस्तृत खबरें पढ़कर उनकी सुर्खियाँ लिख सकेंगे।

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सुझावित विषय / क्षेत्र	सुझावित शिक्षण-अधिगम प्रक्रिया	सुझावित अधिगम स्रोत
<ul style="list-style-type: none"> ➤ शब्द विचार ➤ उपसर्ग – प्रत्यय ➤ तत्सम – तद्भव ➤ संज्ञा, लिंग, वचन, कारक, सर्वनाम, विशेषण, क्रिया, काल और उनके भेद ➤ अव्यय भेद ➤ क्रिया विशेषण ➤ संबंधबोधक ➤ समुच्चयबोधक ➤ निपात ➤ विस्मयादिबोधक ➤ अकर्मक-सकर्मक क्रिया के अतिरिक्त प्रेरणार्थक क्रिया, संयुक्त क्रिया, मिश्र क्रिया, नामधातु क्रिया ➤ अर्थ के आधार पर वाक्य भेद। 	<ul style="list-style-type: none"> ➤ विभिन्न लिपियों – देवनागरी – हिंदी, संस्कृत, नेपाली; रोमन – अंग्रेजी, फ्रेंच, जर्मन; फ़ारसी – उर्दू, अरबी, फारसी; गुरमुखी – पंजाबी आदि की चर्चा करें। ➤ शब्दों के तत्सम – तद्भव रूप की जानकारी दें। नवीन सोच की ओर भी संकेत करें कि 'तत्सम' शब्द वे हैं जो किसी अन्य भाषा से ज्यों के त्यों ले लिए गए हैं, जैसे – मुख, मस्तक, कॉलेज, डॉक्टर, डोसा, उपमा, सिर्फ़, ईमानदार आदि। 'तद्भव' शब्द वे हैं जिन्हें हिंदी भाषा के अनुरूप ढाल लिया गया है, जैसे – माता, किवाड़, साग, अस्पताल आदि। ➤ सर्वनाम के भेदों की पहचान करवाएँ और उनका सही प्रयोग करवाएँ। ➤ सर्वनाम के भेद समझाएँ और बताएँ। कि जब संदर्भ के साथ यह, वह, इन्हें, उन्हें, उसे आदि का प्रयोग हो तब तो निश्चयवाचक सर्वनाम मान सकते हैं। जब संदर्भ न हो तब पुरुषवाचक भी हो सकता है और निश्चयवाचक भी। इसका निर्णय कैसे लें? इसे इस प्रकार स्पष्ट करें कि यदि व्यक्ति के लिए यह, वह का प्रयोग हुआ है तब तो वह पुरुषवाचक सर्वनाम होगा और वस्तु, घटना 	<ul style="list-style-type: none"> ➤ भाषा खेल ➤ विज्ञापनों के नमूने पत्र-पत्रिकाओं से ➤ डायरी लेखन की कुछ पुस्तकें ➤ नोटिस के नमूने, अखबार की सुर्खियों के नमूने ➤ डायरी लेखन <ul style="list-style-type: none"> ☛ तिथि ☛ समय ☛ दिन ☛ स्थान

पढ़ना एवं लिखना

सुझावित विषय / क्षेत्र	सुझावित शिक्षण-अधिगम प्रक्रिया	सुझावित अधिगम स्रोत
<ul style="list-style-type: none"> ▶ रचना के आधार पर वाक्य भेद और परस्पर परिवर्तन ▶ विराम चिह्न ▶ मुहावरे / लोकोक्तियाँ ▶ रोचक अपठित गद्यांश / पद्यांश (स्तारानुकूल) ▶ पत्र लेखन – औपचारिक और अनौपचारिक ▶ निबंध लेखन (200 शब्दों में) ▶ विज्ञापन लेखन / प्रस्तुति – वर्गीकृत (classified) जनहित में जारी, उत्पाद आदि से संबंधित विज्ञापन ▶ डायरी लेखन ▶ नोटिस सूचना लेखन ▶ प्रतिवेदन / रिपोर्ट लेखन ▶ सुर्खियाँ लेखन 	<p>आदि के लिए आया है तो निश्चयवाचक सर्वनाम होगा। इससे समस्या का काफ़ी हद तक समाधान हो जाएगा, जैसे –</p> <ul style="list-style-type: none"> • उसे बुला लाओ / वह बाहर खड़ी है / यह तो यहाँ ही बैठा है। इन वाक्यों में उसे, वह, यह व्यक्तियों के लिए आया है यह विभिन्न क्रियाओं से स्पष्ट है। इन्हें पुरुषवाचक माना जाना चाहिए। • यह यहाँ रख दो। वह वहीं पड़ा रहने दो। उसे उठा लाओ। इन वाक्यों में यह, वह, उसे वस्तुओं के लिए ही प्रयुक्त हुआ है, अतः इन्हें निश्चयवाचक मानना चाहिए। • कुछ अन्य वाक्य देखिये- • उन्हें भी बुला लो / उन्हें रखा रहने दो / उन्हें रहने दो। पहले वाक्य में ‘उन्हें’ व्यक्तियों के लिए ही प्रयुक्त हुआ है जबकि दूसरे वाक्य में वस्तुओं के लिए और तीसरे में व्यक्ति भी हो सकते हैं और वस्तु भी। ऐसी स्थिति में दोनों संभव हैं। संदर्भ ज्ञात हो तो उसी के अनुरूप भेद किया जा सकता है अन्यथा दोनों भेद माने जा सकते हैं। <p>▶ सार्वनामिक विशेषण को समझना आवश्यक है। यह अलमारी बड़ी है और वह छोटी। इस वाक्य में ‘यह’ अलमारी की विशेषता बता रहा है इसलिए सार्वनामिक विशेषण है और ‘वह’ अलमारी के स्थान पर प्रयुक्त हुआ है। इसलिए सर्वनाम है।</p> <ul style="list-style-type: none"> • सर्वनाम और सार्वनामिक विशेषण दोनों रूप रचना के स्तर पर समान होते हैं, केवल वाक्य प्रयोग के स्तर पर ही दोनों में अंतर होता है। जो शब्द संज्ञा के स्थान पर प्रयुक्त होते हैं वे सर्वनाम होते हैं। लेकिन जब कोई सर्वनाम किसी संज्ञा (विशेष्य) के साथ लगाकर संज्ञा की विशेषता बताए तो सार्वनामिक विशेषण होता है, जैसे – कुछ फल लाओ। हमारे देश के जवान चौकस रहते हैं। वाक्यों में कुछ और हमारे शब्द सार्वनामिक विशेषण हैं। 	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>तारीख</p> <p>नोटिस</p> <hr/> <p><u>शीर्षक</u></p> <hr/> <p>हस्ताक्षर</p> </div>

पढ़ना एवं लिखना

सुझावित विषय / क्षेत्र	सुझावित शिक्षण-अधिगम प्रक्रिया	सुझावित अधिगम स्रोत
	<p>▶ विशेषण बनवाएँ, जैसे – यह-ऐसा, वह-वैसा, सुख-सुखद आदि ।</p> <p>▶ क्रिया – कर्म के आधार पर दो भेद – अकर्मक और सकर्मक की पहचान करवाएँ।</p> <p>▶ प्रेरणार्थक क्रिया – प्रेरणार्थक क्रिया और सकर्मक क्रिया के अंतर को समझाएँ। जैसे -</p> <ul style="list-style-type: none"> • पावनी पतंग उड़ा रही है । • पावनी तितली उड़ा रही है । • पहले वाक्य में पावनी क्या उड़ा रही है? – पतंग (निर्जीव संज्ञा) • दूसरे वाक्य में पावनी क्या उड़ा रही है? – तितली (सजीव संज्ञा) • ‘पतंग’ निर्जीव है। अतः पावनी उसमें डोर बाँधकर उड़ा रही है। यहाँ ‘उड़ाना’ सकर्मक क्रिया है। दूसरे वाक्य में पावनी तितली को उड़ने के लिए प्रेरित कर रही है, अतः यहाँ ‘उड़ना’ प्रेरणार्थक क्रिया है। <p>▶ अव्यय – अव्यय के विभिन्न भेदों को समझाकर पहचान करवाएँ। क्रियाविशेषण के भेदों की पहचान के लिए क्रिया के साथ कैसे, कितना, कब और कहाँ लगाकर पहचानने के लिए कहें। पाठ्य पुस्तक से उदहारण छँटवाकर अभ्यास करवाएँ। संबंधबोधक अव्यय और क्रियाविशेषण का अंतर समझाएँ। संबंधबोधक अव्यय संज्ञा या सर्वनाम के बाद प्रयुक्त होकर वाक्य के संज्ञा / सर्वनाम से संबंध बताता है। जैसे –</p> <ul style="list-style-type: none"> • तुम घर के भीतर जाओ। (संबंधबोधक) • वह भीतर चला गया। (क्रिया विशेषण) <p>▶ समुच्चयबोधक अव्यय के दो भेद – समानाधिकरण और व्यधिकरण के बारे में बताएँ।</p> <p>▶ विस्मयादिबोधक – हर्ष, घृणा, दुःख, पीड़ा, व्यक्त करने वाले शब्दों की जानकारी दें।</p> <p>▶ निपात – बल देने वाले शब्द – तो, भी, पर, आदि के प्रयोग से वाक्य के अर्थ या भाव में आए परिवर्तनों की ओर ध्यान दिलाएँ; जैसे – मुझे भी पानी चाहिए। मुझे पानी भी चाहिए।</p>	

पढ़ना एवं लिखना

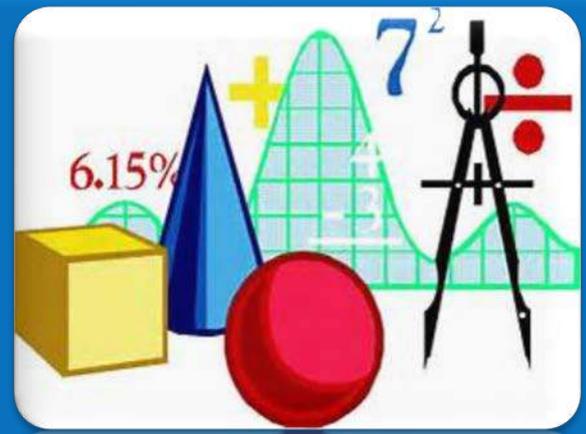
सुझावित विषय / क्षेत्र	सुझावित शिक्षण-अधिगम प्रक्रिया	सुझावित अधिगम स्रोत
	<ul style="list-style-type: none"> ▶ वाच्य भेद – कर्तृवाच्य – मैं पाठ पढ़ती हूँ। कर्मवाच्य – सरकार द्वारा बाढ़ पीड़ितों की मदद की घोषणा की गई। भाववाच्य – उस से चला नहीं जाता। इस प्रकार के वाक्यों का अभ्यास करवाएँ। परस्पर रूपांतरण भी करवाएँ। ▶ रचना के आधार पर वाक्य के तीन भेदों की पहचान करना बताएँ। परस्पर रूपांतरण का अभ्यास भी करवाएँ। संयुक्त से मिश्रित या सरल, सरल से संयुक्त या मिश्रित, मिश्रित से संयुक्त या सरल वाक्यों में परिवर्तन का अभ्यास करवाएँ। ▶ उद्देश्य – विधेय की पहचान, जैसे – हमारे सैनिकों ने शत्रुओं के छक्के छुड़ा दिए। इस वाक्य में ‘हमारे सैनिकों ने’ – उद्देश्य है और ‘शत्रुओं के छक्के छुड़ा दिए’ – विधेय है। अशुद्धि शोधन – अकसर होने वाली अशुद्धियों के बारे में बताएँ और वाक्य शोधन का अभ्यास करवाएँ। ▶ शब्द भंडार विकसित करने के लिए पिछली सूची में नए शब्द जोड़ें। ▶ पाठ्य सामग्री में आए मुहावरों / लोकोक्तियों का प्रयोग समझाएँ और अपने वाक्यों में पुनः प्रयोग करवाएँ। रचनात्मक लेखन में उसका प्रयोग करने के लिए प्रेरित करें। ▶ रोचक अपठित गद्यांश और काव्यांश देकर प्रश्न अभ्यास करवाएँ। सामग्री को स्वयं समझने और उत्तर देने की क्षमता विकसित करें। ▶ पत्र लेखन – औपचारिक और अनौपचारिक पत्रों के प्रारूप स्पष्ट करें। यह भी स्पष्ट करना कि पता, तिथि, विषय, संबोधन और समाप्ति की आवश्यकता क्यों है? भाषा-शैली पर विशेष ध्यान दें। अति संक्षेप या अनावश्यक विस्तार से बचने की प्रेरणा दें (निमंत्रण, बधाई, संवेदना, धन्यवाद के अनौपचारिक पत्र तथा शिकायती पत्र, संपादक के नाम पत्र, प्रार्थना या आवेदन के औपचारिक पत्र लिखवाएँ)। ▶ निबंध लेखन के लिए विद्यार्थियों को उनके स्तर 	

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	<p>के अनुकूल समसामयिक, उनसे संबद्ध और रोचक विषय देकर अभ्यास करवाएँ। निबंध का प्रारंभ मुख्य विषय-वस्तु और उपसंहार को स्पष्ट करें। अलग-अलग अनुच्छेदों में विचार क्रमबद्ध रूप से अभिव्यक्त करने को कहें। ये निबंध वर्णनात्मक, कल्पनात्मक आदि हो सकते हैं।</p> <ul style="list-style-type: none"> ▶ विज्ञापन लेखन – वर्गीकृत, उत्पादों की बिक्री के लिए, जनहित में जारी विज्ञापन के नमूने दिखाकर समझाएँ और विज्ञापन बनवाएँ (विद्यालय में बनाई गई हस्तशिल्प सामग्री – मोमबत्तियाँ, दीये, वॉल हैंगिंग आदि) पेंसिल, पेन, पुरानी साइकिल बेचने हेतु, आदि)। ▶ डायरी लेखन – विशेष दिवस / अवसर / घटनाओं पर डायरी लेखन करवाएँ। ▶ नोटिस – नोटिस का प्रारूप समझाएँ और विद्यालय के क्रिया-कलापों से संबंधित नोटिस लिखवाएँ (वार्षिकोत्सव की तैयारी, नाटक मंचन, वाद-विवाद प्रतियोगिता, खेल दिवस, स्कूल पत्रिका के लिए रचनाएँ आमंत्रित करने हेतु आदि)। ▶ विद्यालयी गतिविधियों पर प्रतिवेदन / रिपोर्ट लिखवाएँ (विद्यालय में मनाए गए वन महोत्सव, सांस्कृतिक प्रतियोगिताएँ, खेल दिवस, भ्रमण आयोजन आदि की रिपोर्ट)। ▶ सुर्खियाँ लेखन - अखबार की रिपोर्ट देकर उसकी सुर्खियाँ लिखवाएँ। शब्द चयन आकर्षक हो, संक्षिप्त हो, इस पर चर्चा करें। 	

MATHEMATICS

Mathematics



Mathematics is one of the most important subjects which is used in daily life and other branches of knowledge. George Polya, a Hungarian Mathematician, describes two kinds of aims for school mathematics: *'A narrow aim, that of turning out employable adults who (eventually) contribute to social and economic development; and A higher aim, that of developing the inner resources of the growing child with regard to school mathematics.'*

The narrow aim specifically relates to numeracy and is taken care at beginning of learning mathematics i.e. elementary schools. The Primary school curriculum focuses on teaching of numbers and operations on them, measurement of quantities, fractions, percentages and ratios: all these are important for numeracy.

The higher aim focuses on developing a child's inner resources, in which the role that mathematics plays is mostly about thinking. Development of inner resources also means equipping children to evolve their own ways of solving problems and generating better algorithms. Clarity of thought and pursuing assumptions to logical conclusions is central to the mathematical enterprise. There are many ways of thinking, and the kind of thinking one learns in mathematics is an ability to handle abstractions.

More importantly, what mathematics offers is a way of doing things: to be able to solve mathematical problems, and more generally, to have the right attitude towards problem solving and to be able to deal with all kinds of problems in a systematic manner.

Problems in teaching and learning of mathematics

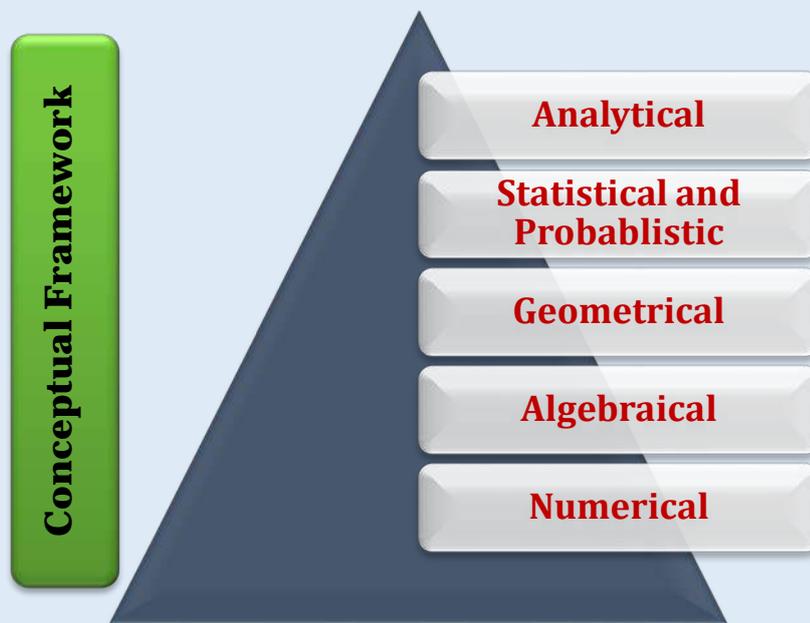
Various researches have highlighted upon some problems that hamper learning of mathematics in schools. The following four problems have been identified to be in the fore front and are the core areas of concern for teachers and practitioners:

1. Most of the children do not find mathematics learning joyful therefore fear mathematics.
2. Curriculum is disappointing for talented minority as well as the non-participating majority in the class i.e not catering to learning needs.
3. Assessment encourages perception of mathematics as mechanical computation and reproduction of learnt facts and algorithms, and
4. Pre service and in- service teacher education and support in the teaching of mathematics is totally inadequate.

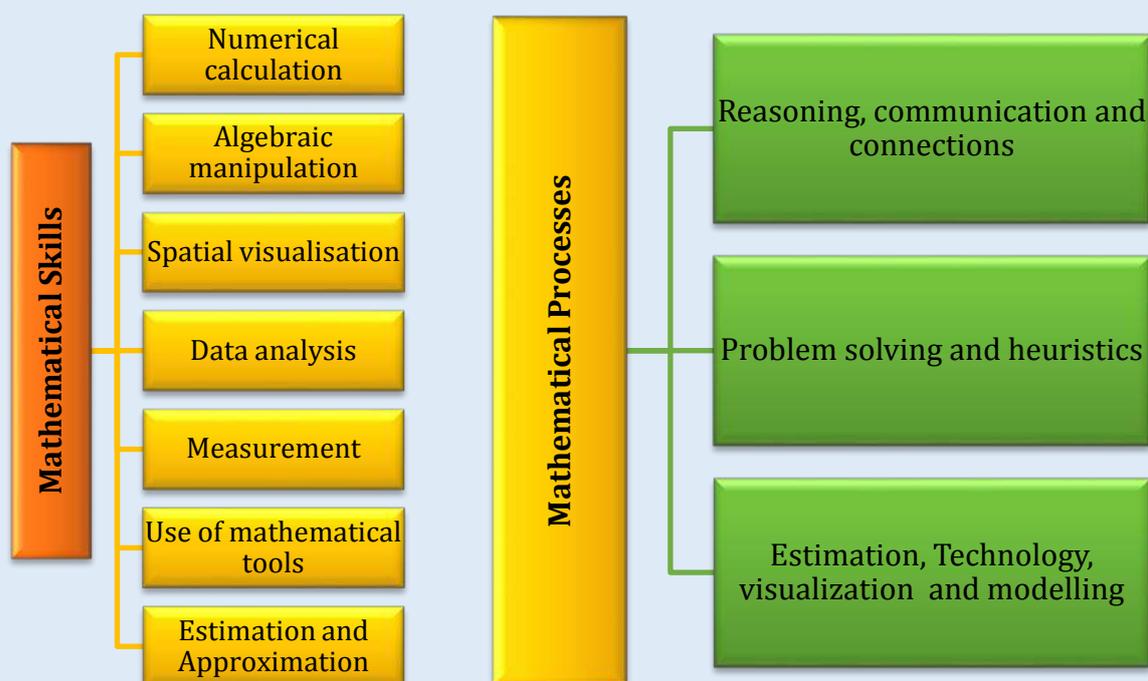
These issues are required to be addressed through the curriculum as and wherever possible. These also need to be expanded on, since they concern the curriculum in essential ways. Concerted efforts therefore, are required to improve learning of mathematics in schools. Major reforms are suggested right from the early to terminal school classes.

Keeping in view the present dismal picture of mathematics learning in schools, it is envisioned that the school mathematics should be such that children:

- 📖 enjoy learning of mathematics.
- 📖 learn importance of mathematics that is much more than a few formulas and mechanical procedures of solving problems. Understanding when and how a mathematical technique is to be used is always more important than recalling the technique from memory (which may easily be done using a book), and the school needs to create such understanding.
- 📖 see mathematics as something to talk about, to communicate, to discuss among themselves, to work together on. Making mathematics a part of children's life experience is the best mathematics education possible.
- 📖 pose and solve meaningful problems.
- 📖 use abstractions to perceive relationships, to see structure, to reason about things, to argue the truth or falsity of statements.
- 📖 understand the basic structure of mathematics: Arithmetic, algebra, geometry and trigonometry, the basic content areas of school mathematics, all offer a methodology for abstraction, structuration and generalization.
- 📖 are expected to be engaged by teacher in class.



The present Mathematics curriculum at the upper primary level aims to develop a number of mathematical skills and processes among children in Classes VI-VIII as presented in the diagram below:



Mathematics at Upper Primary Stage

Mathematics is amazingly compressible: one may struggle a lot, work out something, perhaps by trying many methods, but once it is understood, and seen as a whole, it can be filed away, and used to move forward when needed. The insight that goes into this compression is one of the great joys of mathematics. A major goal of the upper primary stage is to introduce the child to this particular pleasure.

The compressed form lends itself to application and use in a variety of contexts. Thus, mathematics at this stage can address many problems from everyday life and offer tools for addressing them and using it for solving problems. Indeed, the transition from mostly the concrete presentation of mathematics to its exact abstract form and arithmetic to algebra, at once is both challenging and rewarding and is best if seen in this light.

Major Themes

The major themes that will be covered at the Upper Primary stage are highlighted below:

Arithmetic and Algebra

A consolidation of basic concepts and skills learnt in arithmetic in classes at the primary level is necessary from several points of view. Firstly, for ensuring numeracy in all children which is an important aspect of Universalization of Elementary Education (UEE). Secondly, moving from number sense to number patterns, seeing relationships between numbers and looking for patterns in the relationships develops useful life skills in children. Ideas of prime numbers, odd and even numbers and tests of divisibility etc. offer scope for such exploration.

Algebraic notation, introduced at the upper primary stage, is best seen as a compact language, a means of succinct expression. Use of variables, setting up and solving linear equations, identities and factoring are means by which students gain fluency in using the new language. The set theory and its notations need to be introduced here as an important tool to represent most of the mathematics.

The use of arithmetic and algebra in solving daily life problems can be emphasized. However, engaging children's interest and offering a sense of success in solving such problems is essential.

Shape, space and Measures

A variety of regular shapes are introduced to children at this stage: triangles, circles, quadrilaterals, etc. They offer a rich new mathematical experience in at least four ways. Children start looking for such shapes in nature, all around them, and thereby discover many symmetries and acquire a sense of aesthetics. Secondly, they understand how many seemingly irregular shapes can be approximated by regular ones, which becomes an important technique in science. Thirdly, they start comprehending the idea of space: for instance, that a circle is a path or boundary which separates the space inside the circle from that outside it. Fourthly, they start associating numbers with shapes, like area, perimeter etc., and this technique of quantization, or arithmetization, is of great importance. This also suggests that mensuration is best when integrated with geometry. An informal introduction to geometry is possible using a range of activities like paper folding and dissection, and exploring ideas of symmetry and transformation. Observing geometrical properties and inferring geometrical truth is the main objective here. Formal proofs will be dealt with at a later stage.

Visual learning

Data handling, representation and visualization are important mathematical skills which are taught at this stage. They are of immense use as "life skills". Students can learn to appreciate how railway time tables, directories and calendars organize information compactly. Data handling should be suitably introduced as tools to understand process, represent and interpret day-to-day data. Use of graphical representations of data should be encouraged. Formal techniques for drawing linear graphs can be taught. Visual Learning fosters understanding, organization, and imagination. Instead of emphasizing on two-column proofs, students should also be given opportunities to justify their own conclusions with less formal, but nonetheless convincing, arguments. Students' spatial reasoning and visualization skills should be enhanced. The study of geometry should make full use of all available technology. A child when given visual scope to learning remembers pictures, diagrams, flowcharts, formulas, and procedures.

Mathematics and Mathematicians

At all stages of the curriculum, an element of humanizing the curriculum is essential. The development of mathematics has many interesting stories to be told, and every student's daily life includes many experiences relevant to mathematics. Bringing these stories and accounts into the curriculum is essential for children to see mathematics in perspective. Lives of mathematicians and stories of mathematical insights are not only endearing; they can also be inspiring.

Mathematics has been an important part of Indian history and culture, and students can be greatly inspired by understanding the seminal contributions made by Indian mathematicians in early periods of history. Similarly, contributions by women mathematicians from all over the world are worth highlighting. This is important, mainly to break the prevalent myth that mathematics has been an essentially male domain, and also to invite more girls to the mathematical enterprise.

Thus specific emphasis should be given on highlighting the contribution of Indian mathematicians. An appreciation of such contributions will help students see the place of mathematics in our culture.

The discussion on the above aspects and having a clear understanding is essential for every teacher. The curriculum should focus on discussion that will lead to enhancement in pedagogical content knowledge and teaching strategies that conform to the constructivist approach of teaching as emphasised in the National Curriculum Framework- 2005.

Curricular Expectations



Moves from number sense to number patterns.



See relationships between numbers and look for patterns in relationships.



Gain proficiency in using newer language of mathematics like, variables, expressions, equations, identities, etc.



Use arithmetic and algebra to solve real life problems and pose meaningful problems.



Discover symmetries and acquire sense of aesthetics by looking around regular shapes like triangles, circles, quadrilaterals, etc.



Comprehend the idea of space as region enclosed with in boundaries of a shape.



Relate numbers with shapes in terms of perimeter, area and volume and uses them to solve everyday life problems.



Provide reasoning and convincing arguments to justify their own conclusions particularly in mathematics.



Collect, represent (graphically and in tables) and interprets data/information from her/his life experiences.



Handle abstraction in mathematics.

Theme 1: Number System

Rational numbers as extension of integers to make the system closed for division (by non-zero numbers) was introduced in class VII. In this class children will be enabled to explore the properties of rational numbers to find inadequacy in them and to realize the need for new numbers like irrational numbers. Children should also get the feel of another very interesting and important property of rational numbers i.e. between any two rational number there lie many infinite rational numbers. Number line and representation of rational numbers on number line forms the basis for visualizing that for every rational number there is a point on the number line but its converse is not true. Number operations are also extended to exponents. This understanding leads to classify positive integers into various classes like square and cube numbers. Children should also understand and develop the ability to properly apply the division algorithm for finding the square root of numbers.

Learning Outcomes:

Children will be able to:

- ✓ describe properties of rational numbers and express them in general form;
- ✓ consolidate operations on rational numbers;
- ✓ represent rational numbers on the number line;
- ✓ understand that between any two rational numbers there lies another rational number (making children see that if we take two rational numbers then unlike for whole numbers, in this case you can keep finding more and more numbers that lie between them.);
- ✓ generalise and verify properties of rational numbers. (including identities);
- ✓ use general form of expression to describe properties of operations on rational numbers like closer, commutative, associative, existence of identity and existence of inverse;
- ✓ do word problem (higher logic, two operations, including ideas like area);
- ✓ write repeated multiplication and division using integers as exponents;
- ✓ describe and verify laws of exponents with integral powers;
- ✓ find squares, square roots, cubes, cube roots of number;
- ✓ find square and square roots;
- ✓ undertake calculating square roots using the factor and division method for numbers containing;
- ✓ no more than 4 digits and
- ✓ no more than 2 decimal places
- ✓ find cubes and cube roots;
- ✓ estimate square roots and cube roots.
- ✓ learn the process of moving nearer to the required number;
- ✓ write and understand a 2 and 3 digit number in generalized form ($100a + 10b + c$, where a, b, c can be only digit 0-9) and engage with various puzzles concerning this. (like finding the missing numerals represented by alphabets in sums involving any of the four operations.);
- ✓ construct and solve problems and puzzles;
- ✓ solve number puzzles and games;
- ✓ deduce the divisibility test rules of 2, 3, 5, 9, 10 for a two or three-digit number expressed in the general form;
- ✓ find union and intersection of sets;
- ✓ define disjoint sets;
- ✓ find complement of a set.

Number System

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ▶ Rational Numbers <ul style="list-style-type: none"> ☛ Properties of rational numbers. (including identities). Using general form of expression to describe properties ☛ Representation of rational numbers on the number line ☛ Between any two rational numbers there lies another rational number ☛ Word problem ▶ Exponents Powers <ul style="list-style-type: none"> ☛ Laws of exponents with integral powers ☛ Square and Square roots using factor method and division method for numbers containing (a) no more than total 4 digits and (b) no more than 2 decimal places ☛ Cubes and cubes roots (only factor method for numbers containing at most 3 digits) ▶ Playing with numbers <ul style="list-style-type: none"> ☛ Writing and understanding a 2 and 3 digit number <i>in generalized form</i> ($100a + 10b + c$, where a, b, c can be only digit 0-9) and engaging with various puzzles Children to solve and create problems and puzzles. ☛ Deducing the divisibility test rules of 2, 3, 5, 9, 10 for a two or three-digit number expressed in the general form. ▶ Sets <ul style="list-style-type: none"> ☛ Union and intersection of sets ☛ Disjoint set ☛ Complement of a set 	<ul style="list-style-type: none"> ▶ Revising previous concepts learnt by children. ▶ Building on children's previous learning ▶ Involving children in writing general form of rational numbers and associating it with the rules of algebra. The operations on algebraic expressions will help in describing properties of rational numbers. ▶ Encouraging children to use the rules for comparison of integers and fractions to develop their own rules for comparison of rational numbers. ▶ Encouraging children to reach the conclusion that half of the sum of two rational numbers lies between them and thus a rational number can be obtained between any two rational numbers. Providing hints to children while reaching the conclusion that the process of finding a rational number between any two numbers never stops and thus there lies infinite many rational numbers between any two rational numbers ▶ Facilitating children to see and understand that if we take two rational numbers then unlike for whole numbers, in this case you can keep finding more and more numbers that lie between them. ▶ Facilitating children to observe patterns in square numbers and to form their rules for perfect square numbers and square roots. ▶ Facilitating children to observe patterns in perfect cube numbers and form rule for cube root numbers ▶ Encouraging children to play with numbers to find square roots and cube roots using prime factorisation ▶ Encouraging children practice the division method to find square roots of numbers. ▶ Utilising children's understanding about algebra to introduce the generalised form of 2 and 3 digit numbers and to prove divisibility test of numbers. 	<ul style="list-style-type: none"> ▶ Maths Kit

Theme 2: Ratio and Proportion

This theme, at this stage develops in children the ability to understand and appreciate another way of the application of mathematics in daily life called commercial mathematics. The percentage, unitary method, profit and loss, simple and compound interest etc. are based on ratio and proportion. Understanding of ratio and proportion and the skill of applying them in daily life is further required to be strengthened in this class. Children will be properly exposed to higher level problems on profit and loss, compound interest and direct and indirect variations. The problems on these topics should be picked up from daily life situations like banking, taxation, loan transaction etc.

Learning Outcomes:

Children will be able to:

- ✎ solve slightly advanced problems involving application on percentages, profit and loss, overhead expenses, discount and tax;
- ✎ explore the difference between simple and compound interest (compounded yearly up to 3 years or half-yearly up to 3 steps only),
- ✎ arriving at the formula for compound interest through patterns and using it for simple problems;
- ✎ solve simple and direct word problems related to direct and inverse variation, and time and work problems.

Ratio and Proportion		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Slightly advanced problems involving applications on percentages, profit & loss, overhead expenses, Discount, tax. ➤ Difference between simple and compound interest (compounded yearly up to 3 years or half-yearly up to 3 steps only) ➤ Direct and inverse variations – Simple and direct word problems ➤ Time and work problems– Simple and direct word problems 	<ul style="list-style-type: none"> ➤ Arriving at the formula for compound interest through patterns and using it for simple problems. 	<ul style="list-style-type: none"> ➤ Maths Kit

Life Skills: Solving daily life problems

Theme 3: Algebra

In this theme the focus will be on developing skills in children to use linear equations and systems of linear equations to represent, analyse, and solve a variety of problems. They should recognize equations for proportions ($y/x = m$ or $y = mx$) as special linear equations ($y = mx + b$) and use a linear equation to describe the association between two quantities in bivariate data (such as arm span vs. height for students in a classroom). In this class, fitting the model, and assessing its fit to the data are done informally. Interpreting the model in the context of the data requires children to express a relationship between the two quantities in question and to interpret components of the relationship in terms of the situation. They should be able to strategically choose and efficiently implement procedures to solve linear equations in one variable, understanding that when they use the properties of equality and the concept of logical equivalence, they maintain the solutions of the original equation. Children will be able to solve systems of two linear equations in two variables and relate the systems to pairs of lines in the plane; these intersect, are parallel, or are the same line. They will also understand the construction of algebraic expressions and extend the addition and subtraction to multiplication and division of expressions. In this Class children should understand various identities and their use in solving problems related to multiplication and division (factorization) of algebraic expressions.

Learning Outcomes:

Children will be able to:

- ✘ multiply and divide algebraic expressions (integral coefficient only);
- ✘ focus on some common errors like $2 + x \neq 2x$, $7x + y \neq 7xy$ etc.;
- ✘ prove and use identities $(a \pm b)^2 = a^2 \pm 2ab + b^2$, $a^2 - b^2 = (a - b)(a + b)$ $(a \pm b)^2 = a^2 \pm 2ab + b^2$;
- ✘ factorize algebraic expressions (simple cases only) as examples the following types $a(x + y)$, $(x \pm y)^2$, $a^2 - b^2$, $(x + a)(x + b)$;
- ✘ solve linear equations in one variable in contextual problems involving multiplication and division (simple rational coefficient in the equations);
- ✘ multiply two algebraic expressions and forms algebraic identities for square of binomials;
- ✘ factorize an algebraic expression using identities;
- ✘ find solution to inequalities in one variable using properties of in equalities.

Algebra		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ▷ Algebraic Expressions ▷ Multiplication and division of algebraic expression (Coefficient should be integers) ▷ Identities $(a \pm b)^2 = a^2 \pm 2ab + b^2$, $a^2 - b^2 = (a - b)(a + b)$. ▷ Properties of in equalities. ▷ Factorisation (simple cases only) as examples the following types $a(x + y)$, $(x \pm y)^2$, $a^2 - b^2$, $(x + a)(x + b)$ 	<ul style="list-style-type: none"> ▷ Encouraging children to undertake multiplication of algebraic expressions based upon the distributive property of multiplication over addition and subtraction of numbers. Moreover, children already have the idea that same number multiplied repeatedly can be expressed in powers and the same is true for variables. Children should be encouraged 	<ul style="list-style-type: none"> ▷ Maths Kit.

Algebra

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p>➤ Solving linear equations in one variable in contextual problems involving multiplication and division (word problems) (avoid complex coefficient in the equations)</p>	<p>to develop their own results for algebraic identities by using the multiplication of algebraic expressions.</p> <p>➤ Continuing the idea of numerical coefficient and factors of a term to evolve methods of writing an expression in terms of product of two or more expressions. This will lead to the factorisation of algebraic expressions.</p> <p>➤ Drawing attention of children to and laying special emphasis on the common errors that children commit while learning algebra like $2 + x = 2x$, $7x + y = 7xy$ etc.</p>	

Skill: establish relationship between known and unknown facts

Theme 4: Geometry

The theme in this class will focus on making the definitions more meaningful and enabling children to perceive relationships between properties and figures. Logical implications and class inclusions should be understood, but the role and significance of deduction may not be understood.

The children will be prepared to enter into the fourth level of geometrical thinking at this stage by learning informal deduction in this class. They learn to construct proofs, understand the role of axioms and definitions, and know the meaning of necessary and sufficient conditions. The children should be able to give reasons for steps in a proof. The another important way of learning about shapes and figures is through relating it with numbers i.e using the analytical geometry. Initiation of this process will be done in this class with introduction of representing any point in a plane as ordered pair of real numbers. With this introduction child should be able to geometrically represent numerical relation between two variables Children will then construct the concept of linear graph and relationship between the variables as linear equation.

Learning Outcomes:

Children will be able to:

- ✗ explore and verify properties of quadrilaterals like sum of angles of a quadrilateral is equal to 360° (by verification);
- ✗ explore and verify properties of parallelogram (by verification) like
 - (i) opposite sides of a parallelogram are equal,
 - (ii) opposite angles of a parallelogram are equal,
 - (iii) diagonals of a parallelogram bisect each other. [also find justification to why (iv), (v) and (vi) follow from (ii)]
 - (iv) diagonals of a rectangle are equal and bisect each other
 - (v) diagonals of a rhombus bisect each other at right angles.
 - (vi) diagonals of a square are equal and bisect each other at right angles.
- ✗ identify and match pictures with objects [more complicated e.g. nested, joint 2-D and 3-D shapes (not more than 2)];
- ✗ draw 2-D representation of 3-D objects (continued and extended);
- ✗ count number of vertices, edges & faces & verifying Euler's relation for 3-D figures with flat faces (cubes, cuboids, tetrahedrons, prisms and pyramids);
- ✗ generalize the sum of angles of quadrilateral and use it in solving various problems related to finding angles of a quadrilateral;
- ✗ explain properties of parallelograms and tries to reason out how one property is related to other;
- ✗ represent 3-D shapes on a plan surface like paper, board, wall etc.;
- ✗ make nets of prisms and pyramids and forms the shapes from the nets;
- ✗ construct quadrilaterals using pair of compasses and straight edge given:
 - ☛ four sides and one diagonal
- ✗ three sides and two diagonals
 - ☛ three sides and two included angles
 - ☛ two adjacent sides and three angles
- ✗ construct quadrilaterals given:
 - ☛ four sides and one diagonal
 - ☛ three sides and two diagonals
 - ☛ three sides and two included angles
 - ☛ two adjacent sides and three angles.
- ✗ describe the meaning of axes (same units), Cartesian plane, plotting points for different kind of situations (perimeter vs length for squares, area as a function of side of a square, plotting of multiples of different numbers, simple interest vs number of years etc.);
- ✗ read linear graphs;
- ✗ distinguish the shapes that are symmetrical and find line of symmetry by paper folding;
- ✗ define and identify various parts of a circle.

Geometry

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p>➤ Understanding shapes:</p> <ul style="list-style-type: none"> ☛ Properties of quadrilaterals – Angle Sum property ☛ Properties of parallelogram (By verification) (i) Opposite sides of a parallelogram are equal, (ii) Opposite angles of a parallelogram are equal, (iii) Diagonals of a parallelogram bisect each other. (iv) Diagonals of a rectangle are equal and bisect each other. (v) Diagonals of a rhombus bisect each other at right angles. (vi) Diagonals of a square are equal and bisect each other at right angles. <p>➤ Representing 3-D in 2-D</p> <ul style="list-style-type: none"> ☛ Identify and match pictures with objects [more complicated e.g. nested, joint 2-D and 3-D shapes (not more than 2)]. ☛ Drawing 2-D representation of 3-D objects (Continued and extended) ☛ Counting vertices, edges & faces & verifying Euler's relation for 3-D figures with flat faces (cubes, cuboids, tetrahedrons, prisms and pyramids) <p>➤ Construction of Quadrilaterals:</p> <ul style="list-style-type: none"> ☛ Given four sides and one diagonal ☛ Three sides and two diagonals ☛ Three sides and two included angles ☛ Two adjacent sides and three angles <p>➤ Idea of reflection symmetry and symmetrical shapes</p> <p>➤ Circle</p> <ul style="list-style-type: none"> ☛ Circle, centre, radius/ diameter, arc, chord, sector and segment. 	<p>➤ Involving children in activities of measuring angles and sides of shapes like quadrilaterals and parallelograms and to identify patterns in the relationship among them. Let them make their hypothesis on the basis of the generalisation of the patterns and later on to verify their assertions.</p> <p>➤ Involving children in expressing/representing a 3-D shape into 2-D from their life like drawing a box on plane surface, showing bottles on paper etc.</p> <p>➤ Facilitating children making nets of various shapes like cuboids, cubes, pyramids, prisms etc. Again from nets let them make the shapes and to establish relationship among vertices, edges and surfaces. Through pattern let them reach to Euler's relation.</p> <p>➤ Constructing various figures by children using compasses and a straight edge. But it is also important to involve children to argue why a particular step is required. For example, on drawing an arc using compasses we find all those points that are at the given distance from the point where the metal end of the compasses was placed.</p>	<p>➤ Maths Kit</p> <p>➤ Geoboard with rubber band</p> <p>➤ Geometry box</p>

Life Skill: deductive reasoning

Theme 5: Mensuration

Children should be clear about the idea of area as measure of region occupied by a shape on a surface and the formulae to find area of rectangle and square. In this class the theme will enable them to evolve the methods of finding the area of shapes like trapezium and other polygons. The idea behind the formulae of finding area of rectilinear shapes is moving from known to unknown i.e. developing the methods using the formulae they know like rectangle. Children will develop the ability to think how a trapezium and parallelogram can be converted into a rectangle of same area. Using this understanding the methods of finding the surface area of 3-D figures is to be introduced. For this the nets of simple figures like cuboid will be useful to visualize the shapes of different surfaces of this figure. This visualization will help children in evolving formula for finding area of all surfaces. There are many figures like cuboid in children's vicinity like room with four walls, roof and floor, and cartons used for packing various items. Problems related to finding surface area and volume/capacity of such shapes are in children's daily life. Therefore, in this class children should be able to construct meaningful problems and solve them using this understanding.

Learning Outcomes:

Children will be able to:

- find area of trapezium and polygons by using square grid and also by using formulae;
- find surface area of cuboid, cube and cylinder through their nets and later on by using formulae;
- form formula to find volume of a cuboid and cylinder by observing and generalizing patterns of counting units cubes that completely fill the cuboids.
- find volume and capacity (measurement of capacity) of cuboidal and cylindrical vessels

Mensuration		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Area of a trapezium, a polygon and semi-circle. ➤ Surface area of a cube, cuboid, cylinder. ➤ Idea of Total surface area and curved surface areas of various 3-D figures ➤ Concept of volume, measurement of volume using a basic unit, volume of a cube, cuboid and cylinder ➤ Volume and capacity (measurement of capacity) 	<ul style="list-style-type: none"> ➤ Revising previous concepts learnt by children. ➤ Building on children's previous learning ➤ Encouraging children to discuss in groups about converting trapezium and parallelograms into rectangles of equal area. This will help them in formation of formulae to find these areas. ➤ Involving children in finding the surface area of a cube and cuboid and in opening such boxes and realizing that all these surfaces are made up of rectangles and squares only. The rest of the activity will be focused on finding the total surface area (TSA) which will only be to add these areas. 	<ul style="list-style-type: none"> ➤ Maths Kit ➤ Daily use readymade 2D,3D shapes

Mensuration		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
	<p>➤ Based on children's previous learning and understanding and the vocabulary they have related to measurement of volume and capacity through their daily life experiences involving them in activities to get a feel of filling a given space and to measure it by just counting the unit items that fill it completely. This will also help them in deciding why a cube is taken as a unit of measuring volume.</p>	

Life Skills: Solving daily life problems

Theme 6: Data Handling

Based on children's learning about mean, median and mode in earlier classes, in this class, children will be enabled to develop the ability to apply this learning for data with large number of observations which may require to be grouped. Avoid giving irrelevant numbers as data. Let children collect data and find an appropriate average. They will also learn to interpret pie charts being commonly seen in newspapers. Once they are comfortable with interpretation they will learn to represent data as pie charts. Understanding that the probability of chance event is a number between 0 and 1 that expresses the likelihood of the event occurring is developed in this class. Through various random experiments like tossing of coin, throwing a die, occurrence of a letter say E in random selected paragraphs etc. children should infer larger numbers indicate greater likelihood. The ability to find that a probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely (called as equally likely event), and a probability near 1 indicates a likely event will also be focused on.

Learning Outcomes:

Children will be able to:

- arrange ungrouped data into groups and represent grouped data through bar-graphs;
- construct and interpret bar-graphs;
- interpret simple pie charts with reasonable data numbers;
- consolidate and generalise the notion of chance in events like tossing coins, dice etc. and relating it to chance in life events;
- throw a large number of identical dice/coins together and aggregating the result of the throws to get large number of individual events. observing the aggregating numbers over a large number of repeated events;
- make a hypothesis on chances of coming events on the basis of its earlier occurrences like after repeated throws of dice and coins;

Data Handling		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Arranging ungrouped data, it into groups, representation of grouped data through bar-graphs, constructing and interpreting bar-graphs. ➤ Simple Pie charts with reasonable data numbers ➤ Consolidating and generalising the notion of chance in events like tossing coins, dice etc. Relating it to chance in life events. 	<ul style="list-style-type: none"> ➤ Conducting activities with children 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. ➤ Involving children in making their assumption for the future events on the basis of the above data. Observing the aggregating numbers over a large number of repeated events will also help them in forecasting the chances of future events. Comparing with the data for a coin. Observing strings of throws will help children in developing notion of randomness. 	<ul style="list-style-type: none"> ➤ Maths Kit ➤ Coins, dice, etc.

Life Skills: Understanding and interpreting data, drawing inferences

HISTORY, CIVICS
&
GEOGRAPHY

History, Civics and Geography (HCG)



The curriculum of History, Civics and Geography has been developed with an objective to make children understand the working of the world around them. This particular area of study equips the children with the knowledge and understanding of the past, which is necessary for coping with the present and planning for the future. The curricular area of Civics makes them aware of the socio-political life, whereas Geography connects them directly to their environment. The area of History will help them understand how their present has evolved from centuries of development.

The focus of this area of the curriculum is to help children acquire and develop the ability to make interconnections between processes and events; between developments in the past and the present; and between one curricular area to another. Learning opportunities have been provided to help children understand how geographical conditions of a place have affected the socio-political life of the people.

Objectives of teaching History, Civics and Geography

To enable children to:

- ◆ learn about the past by creating a sense of historical diversity;
- ◆ understand time lines and historical maps;
- ◆ compare the developments of one region in relation to other parts of the world;
- ◆ become aware of national perspectives with that of global ones in the process of development;
- ◆ creating a strong a sense of human values, namely freedom, trust, mutual respect and respect of diversity;
- ◆ make connections between political, social and economic issues and recognize the ways in which politics affects their daily lives.
- ◆ imbibe the values of the Indian Constitution and their significance in everyday life.
- ◆ understand about the earth as the habitat of humans and other forms of life.
- ◆ become familiar with one's own region and realise the interdependence of various regions (local to global).
- ◆ understand the normative dimensions like issues of equality, justice and dignity in society and polity.

Skills	Learning Outcomes
Observing and reporting: Observing, exploring, comparing, analysing, discussing and reporting, expressing, drawing conclusions and reflecting in behaviour.	
Discussion and debate: Brainstorming expressing, discussing good and bad effects, listening and appreciating varied opinions, synthesising ideas and information.	
Analysing and critical thinking: Defining situations/events, identifying and predicting possible causes, analysing results and consequences, comparing and drawing results.	
Questioning and reasoning: Demonstrating curiosity, logical understanding of facts, raising critical questions.	
Communication: Listening, expressing, articulating thoughts and ideas, writing.	
Classification: Identifying similarities and dissimilarities, sorting/grouping with reasoning and understanding.	
Interpersonal and Intrapersonal skills: Motivation from the great personalities and their lives, helping, cooperating and working as a team.	
Appreciation: Showing respect towards other people's opinions, ideas, beliefs and ways of life.	
Understanding: The responsibility towards institution, society and environment, adaptation by humans to changing circumstances, the role of invention and discoveries of past in the present-day world, value and importance of national festivals.	
Concern for justice and equality: Sensitivity towards the marginalised, less privileged, people with disability, gender sensitivity and care and concern for environment.	
Map and globe skills: Understanding concept of direction, using signs, symbols and keys, interpreting maps of various types.	
Charts and graphs skills: Collecting systematically and recording data, presenting it in the form of bar graphs, pie charts, diagrams, analysing and interpreting it.	
Time skills: Sequencing events, observing a calendar and marking important dates on it, constructing timelines and marking important dates on it, marking and understanding AD and BC on it, understanding time zones.	
Citizenship skills: Identifying rights and duties of citizens, appreciating the cultural aspects of various religions, languages, regional and ethnic groups, recognising and accepting equality of all human beings, irrespective of gender, caste and creed.	
Critical thinking and problem solving: Sound reasoning, making complex choices and decisions, understanding interconnections among systems, framing, analysing and synthesizing information.	
Collaboration: Demonstrating ability to work effectively with diverse teams, exercising flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal, assuming shared responsibility for collaborative work.	
Information literacy: Accessing information efficiently and effectively, evaluating information accurately and creatively. Processing a fundamental understanding of the ethical and legal issues regarding access and use of information.	
Media and ICT literacy: Understanding the construction of media messages, interpretation of messages, influence of media on views beliefs and behaviour, fundamental understanding of ethical and legal issues related to access and use of information.	
Flexibility and adaptability: Adopting varied roles and responsibilities, working effectively in a climate of ambiguity and changing priorities.	
Initiative and self-direction: Utilizing time effectively, updating skills, defining and prioritizing tasks, demonstrating initiatives, demonstrating commitment towards work.	
Social and Cross-Cultural Skills: Working appropriately and productively with others, leveraging the collective intelligence of groups, bridging cultural differences.	
Leadership and Responsibility: Using interpersonal and problem skills, leveraging strengths of others to accomplish a common goal, demonstrating integrity and ethical behaviour, acting responsibly with the interests of the larger community in mind.	



History and Civics

The present curriculum in History and Civics should be comprehended critically so that children understand and participate effectively in their world and use critical moral and mental energy against social forces that threaten democratic values and respect for diversity in their country. The curriculum areas in History provide an understanding of those aspects of past which are crucial to understand present day global world. Interesting pedagogies will help children grow as responsible civic citizens in a secular democracy.

Core concepts of History and Civics for Classes VI-VIII are as under:

Class VI

The Ancient World

The River Valley Civilizations
The Vedic Civilization
Mahavira & Buddha – Great Preachers
Rise of Kingdoms & Republicans
The Mauryan Empire
The Golden Age – Gupta Empire

Civics

The Rural Local Self Government
Urban Local Self Government

Class VII

The Medieval World

Medieval Europe – Rise and Spread of Christianity
Rise and Spread of Islam
The Delhi Sultanate
The Vijayanagar and Bahamani Kingdoms
The Mughal Empire
Making of Composite Culture

Civics

The Constitution of India
Directive Principles of State Policy

Class VIII

The Modern World

A Period of Transition
The Growth of Nationalism
India in the 18th Century
Traders to Rulers
British Policies and Impacts
The Great Uprising of 1857
Socio-Religious Reforms
India's Struggle for Freedom

Civics

The Three main organs of the Indian Government: Legislature, Executive, Judiciary
United Nations

The Modern World

Theme 1: A Period of Transition

The theme 'A Period of Transition' will enable children to understand the process of change in the world due to the renaissance, industrial revolution and imperialism. The renaissance was a socio-cultural movement that spanned between the 14th-18th centuries. It influenced literature, philosophy, art, politics, science and religion. Industrial revolution and imperialism marked a lasting impact on the countries across the globe. In a globalized society, an understanding of the different periods of transition is critical for developing the understanding of children about the modern world.

Learning outcomes:

Children will be able to:

- ☑ create a general idea of events and changes that occurred all over the world during the period of study;
- ☑ identify the basic differences between primary and secondary sources;
- ☑ recognize, understand and reflect on the important movements such as renaissance, reformation;
- ☑ analyse the radical changes brought about by the industrial revolution;
- ☑ evaluate the impact of imperialism on the world.

A Period of Transition

Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ The period of transition – basic understanding. ➤ Sources – Primary and Secondary. ➤ Transition from Medieval to Modern Age (a brief mention of Renaissance, Reformation, Voyages, discoveries). ➤ The Industrial Revolution – meaning and reasons why it began in England, major inventions, Impacts of Industrial Revolution. ➤ Imperialism- Its meaning, caused and impacts with special reference to South Asian Countries. 	<ul style="list-style-type: none"> ➤ Organising discussions on: <ul style="list-style-type: none"> ☛ the Renaissance – its meaning features, impact, etc. ☛ the voyages and discoveries in the 16th - 18th centuries. ☛ studying history through various sources and evidences. ☛ the preservation/conservation of historical records. ☛ life and times before the industrial revolution. ☛ analysing the impacts of imperialism and colonialism with special reference to India. ➤ Conducting a debate on the positive and negative impacts of the Industrial Revolution on societies all over the world. ➤ Planning and organising a visit to the archives, followed by the children preparing a report on the trip. ➤ Enactment/role plays/skit by children on the Industrial revolution, voyages and discoveries. 	<ul style="list-style-type: none"> ➤ Charlie and the Chocolate Factory ➤ Industrial Revolution through Charlie Chaplin. ➤ Audio-visual aids <ul style="list-style-type: none"> ☛ News Papers and ICT. ☛ Local villages. ☛ Archives. ☛ Factory or Industrial Unit.

A Period of Transition

Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
	➤ Assigning project work (after a visit to a factory or an industry manufacturing goods), on preparing a comparative analysis on handmade and manufactured goods.	

Life Skills: Social skills- respect, empathy, sensitivity, compassion

Communication skills: Listening and verbalizing



Theme 2: The Growth of Nationalism

The theme 'The Growth of Nationalism' is crucial for enabling children to understand the changes in the thought process of people and the demand for equality and liberty in France and America. These movements finally resulted in social, political, religious and economic justice to the people of France and America and ended monarchy. This theme will help children understand how the world they live in has evolved in last three centuries.

Learning outcomes:

Children will be able to:

- ☑ identify the earliest Nationalist movements in history;
- ☑ examine major changes that occurred in the world due to the French revolution and the American War of Independence;
- ☑ analyse various factors leading to the French revolution;
- ☑ trace the history of the American War of Independence;
- ☑ identify the reasons for the Civil war;
- ☑ analyse the role played by Abraham Lincoln;
- ☑ evaluate and assess the impact of the civil war.

The Growth of Nationalism

Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ The French Revolution – causes, the outbreak, impact, the post – revolution period, Napoleon Bonaparte (brief study of the revolution). ➤ The American War of Independence - colonies, causes, beginning, birth of the United States of America. ➤ American Civil War - background, causes, beginnings, role of Abraham Lincoln and the Gettysburg Address. 	<ul style="list-style-type: none"> ➤ Organising discussions on: <ul style="list-style-type: none"> ☛ the pros & cons of War ☛ the French Revolution and the ideas of Freedom, Equality and Fraternity. ☛ impact of the American Civil War. ➤ Audio Visual shows: <ul style="list-style-type: none"> ☛ Documentaries on 'The French Revolution' and 'The American War of Independence'. ☛ the Life and times of Abraham Lincoln. ➤ Enactment/ role plays/skits by children: <ul style="list-style-type: none"> ☛ based on the meeting of the Constituent Assembly in the French Revolution. ☛ on 'Abraham Lincoln.' ➤ Conducting activities: <ul style="list-style-type: none"> ☛ preparing a mind map of the related topics in a sequential order. ☛ organising a one-day seminar on the American Civil War. ☛ interactive time line. ☛ developing and showing a PPT on the American Civil war. 	<ul style="list-style-type: none"> ➤ Audio-visual aids- documentaries, clippings on American, French Revolution. ➤ Books. ➤ Short questions. ➤ Quizzes.

Theme 3: India in the 18th Century

The theme 'India in the 18th Century' focuses on developing an understanding of how the medieval period in Indian history gradually drew to a close following the death of Aurangzeb which marked the decline of the Mughal Empire. This was followed by the rise of independent regional kingdoms. These kingdoms were founded by powerful nobles who took advantage of the weak central authority and began to break away from the Mughal Empire. Children will also understand and appreciate the transition of India from medieval Mughal era to the modern British Period.

Learning outcomes:

Children will be able to:

- ☑ identify the Mughal rulers who ruled after Aurangzeb (later Mughals);
- ☑ discuss factors responsible for the decline of the Mughal empire;
- ☑ examine the rise of regional kingdoms;
- ☑ recognize the rising power of the Marathas under the Peshawas.

India in the 18th Century

Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Decline of the Mughal Empire – (Major factors/causes). ➤ Rise of independent/regional kingdoms- Hyderabad, Awadh, Bengal, Rajputs, Sikhs, Mysore, Marathas (brief). 	<ul style="list-style-type: none"> ➤ Building on children's previous learning. ➤ Organising discussions on: <ul style="list-style-type: none"> ☛ various reasons leading to the decline of the Mughal Empire. ☛ the invasion of Nadirshah and Ahmad Shah Abdali. ☛ factors that led to the rise of independent kingdoms. ☛ achievements of Hyder Ali and Tipu Sultan. ➤ Tracing the important independent kingdoms on an outline map of India. ➤ Audio Visual shows on: <ul style="list-style-type: none"> ☛ invasions of Nadir Shah and Ahmad Shah Abdali. ☛ the times of later Mughal Emperors. ☛ Haider Ali and Tipu Sultan. This may be followed by discussions. ➤ Enactment/role play by children on 'Tipu Sultan.' ➤ Conducting quizzes on various aspects of the theme. For e.g. Tipu Sultan, Ahmad Shah Abdali, Mughal Emperors. 	<ul style="list-style-type: none"> ➤ Essays and articles writings. ➤ Animated clips, videos and photographs of revolution. ➤ Quizzes. ➤ Map of India. ➤ Costumes and articles required for role plays.

Theme 4: Traders to Rulers

'Traders to Rulers' will help children understand how the British gradually gained political control over India and established their supremacy over different parts of the country. They will discover and gain insights into how the Battles of Plassey and Buxar led to the establishment of the British as a major power in India. Most parts of India were either directly or indirectly controlled by the British through various expansionist policies. They will also develop the ability to analyse the conditions of 18th century India and the impact of colonial rule on the country.

Learning outcomes:

Children will be able to:

- ☑ understand and discuss the system of trade and commerce in India in the 17th and 18th centuries;
- ☑ identify the intense rivalry among the trading companies;
- ☑ discuss the impact of the Battle of Plassey and Buxar in strengthening the British position in India;
- ☑ understand the expansionist policy of the British with reference to dual government, doctrine of lapse, subsidiary alliance and annexation of Avadh.

Traders to Rulers

Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Advent of English East India Company- a brief mention ➤ Conquest of Bengal- Battle of Plassey, Buxar- causes and results. ➤ Dual Government- Drawbacks of Dual government. ➤ Policy of British Expansion (meaning and examples) – Doctrine of lapse, Subsidiary Alliance, Annexation of Awadh (pretext). 	<ul style="list-style-type: none"> ➤ Building on children's previous learning and experiences. ➤ Drawing a timeline and understanding dates on it ➤ Organising discussions on: <ul style="list-style-type: none"> ☛ Political, Trade and Commerce conditions of 18th century India. ☛ Conspiracies and rivalries for succession in the kingdoms. ☛ Strategies and new type of arms of the East India Company. ☛ Expansionist policy of the East India company. ➤ Written assignments may include: <ul style="list-style-type: none"> ☛ Research work by children in groups or individually on the impact of British policies of expansion. They can write a small report. ☛ Mind mapping on the annexation of Awadh. ☛ The reasons for victory of the British over native rulers. ➤ Narrating events based on the rivalry among the trading communities and the monopoly of the East India. Company. ➤ Depicting the British policy of expansion in the form of a small skit/play. ➤ Screening of a documentary/films/audio-videos on the advent of the East India Company in India. ➤ Organising a role play by children on the East India Company coming to India and the British taking over the country. 	<ul style="list-style-type: none"> ➤ Audio-visual aids ➤ Documentary, videos and films ➤ Books ➤ E-Content

Theme 5: British Policies and Impacts

'British Policies and Impacts' will enable children to understand that apart from the pro-western educational policy, the British also made administrative decisions, which affected India's economic structures. The main aim of the British government was to establish India as an agricultural supplier of cheap raw materials to the industries in England. Children will also be able to analyse the impact of British Rule on native traders, peasants and artisans.

Learning outcomes:

Children will be able to:

- critically analyze and reflect on the economic policy of India under the Company;
- identify the different land revenue systems introduced by the British;
- discuss and examine the impacts of the British rule on the traditional industries;
- evaluate and analyze the educational policy of the British.

British Policies and Impacts		
Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Economic policy <ul style="list-style-type: none"> ☛ <i>Land Revenue system (Permanent Settlement, Mahalwari, Ryotwari), highlight Permanent Settlement only,</i> ➤ Exploitation of artisans and weavers. ➤ Drain of wealth. ➤ Introduction of Modern Education. <p><i>Wood's Despatch (What was Wood's despatch and its effects).</i></p>	<ul style="list-style-type: none"> ➤ Building on children's previous learning and daily life experiences. ➤ Organising discussions on: <ul style="list-style-type: none"> ☛ Comparing the economic condition of peasants, artisans and traders before and after the British rule. ☛ The pros and cons of the Land Revenue System with special mention of the permanent settlement. ☛ The objectives of British rulers for the introduction of modern education and its impacts. ☛ The long-term impact of the economic policy of British rulers. ➤ Written assignments on: <ul style="list-style-type: none"> ☛ A Case study on 'Wood's Despatch' and its effects. ☛ Research undertaken in groups/individually on the impacts of colonial policies on peasants and artists. ➤ Conducting a debate on the impact of modern education and introduction of English language in India - pros and cons. ➤ Screening of a movie on different aspects of the theme. ➤ Enactment/ role plays to highlight the exploitation of peasants under the British rule. 	<ul style="list-style-type: none"> ➤ Case study ➤ Research ➤ Mind Mapping

Theme 6: The Great Uprising of 1857

'The Great Uprising of 1857' deals with the first War of Independence of India against the oppressive colonial rule. The theme aims at enabling children to understand the reasons and results of the uprising and also the beginning of the National Movement in India.

Learning outcomes:

Children will be able to:

- analyse the reasons for the great uprising;
- trace and locate centres of the great uprising on an outline map of India;
- discuss the policy of lapse;
- examine the consequences of the great uprising of 1857.

The Great Uprising of 1857

Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Reasons – political, socio religious, economic, military. ➤ Immediate causes. ➤ Leaders and Spread of the uprising ➤ Consequences. ➤ Nature of uprising. 	<ul style="list-style-type: none"> ➤ Organising discussions on: <ul style="list-style-type: none"> ☛ The social, political and economic conditions in the 19th century India. ☛ Analysing reasons for discontentment of the sepoys in the British army. ☛ Lord Dalhousie's policy of Lapse. ➤ Audio-Visuals shows on: <ul style="list-style-type: none"> ☛ Events that led to the great uprising of 1857. ☛ Leaders and centres of the Uprising and their contribution to the uprising of 1857. ➤ Enactment /Role plays by children: <ul style="list-style-type: none"> ☛ preparing a script for role play on Rani Laxmi Bai and its enactment in class. ☛ scripting a dialogue between Mangal Pandey and a British officer insisting on using the Enfield rifle. ➤ Written assignment based on: The last Mughal Emperor Bahadur Shah Jaffar and receiving threats of annexation of Empire by the British Rulers - ask children to write a report on the oppressive policies of the British rulers and read it in class. ➤ On an outline map of India ask children to mark the important centres of the uprising. ➤ Organising visits to important places related to the uprising and sharing their experiences. 	<ul style="list-style-type: none"> ➤ Related videos and PPTs. ➤ ICT. ➤ Related books and comic series.

Theme 7: Socio-Religious Reforms

The theme 'Social Reformers' deals with the socio-religious awakening in the 19th century India during which period educated Indians initiated a number of movements to bring about socio-cultural changes in the Indian society. This was the result of the British era bringing about many changes in almost every aspect of Indian society. British imperialism led to the imposition of western ideas about rationality and scientific thinking on Indian society. The theme aims at enabling children to understand how the native people in India started resisting colonial ideas of superiority.

Learning outcomes:

Children will be able to:

- ☑ identify the socio-religious practices that existed in Indian society in the 19th century;
- ☑ discuss the importance of social reform movements during the 19th& 20th century raising awareness about prevalent social practices;
- ☑ explain the efforts of the reformers to deal with issues such as caste system, child marriage, sati pratha, etc.;
- ☑ analyse the impact of the reform movement on the Indian society;
- ☑ appreciate the role of social reformers.

Socio-Religious Reforms		
Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Contribution of Social Reformers in brief: Raja Ram Mohan Roy, Ishwar Chand Vidyasagar, Dayanand Saraswati, Swami Vivekanand, Jyotiba Phule, Annie Beasant, Veerasalingam, Kandukuri, Sree Narayana Guru, Sir Syed Ahmad Khan and Singh Sabhas 	<ul style="list-style-type: none"> ➤ Building on children's previous learning and daily experiences and views. ➤ Organising discussions on: <ul style="list-style-type: none"> ☛ the social evils in the Indian society in 18th century India under the British rule. ☛ Comparing society in India in the 19th century with that of the present day. ☛ role of the different social reformers and their impact on society. ➤ Enactment /Role Plays/Skits by children on the evils present in the Indian society during the British rule. ➤ Conducting debates on existing social evils (post-independence). ➤ Written assignments on: <ul style="list-style-type: none"> ☛ Preparing multiple choice questions for revision. ☛ Case study on the contribution of different social reformers. ☛ Research undertaken on the British rule and writing project reports on the conditions of women in the 19th century. ➤ Preparing a collage of social reformers. 	<ul style="list-style-type: none"> ➤ Related PPT's/Audios/visuals. ➤ Books/ICT. ➤ Essays, Articles, animated clips. ➤ Audio visuals. ➤ Role Play ➤ Debate ➤ Creative expression ➤ Collage making

Theme 8: India's Struggle for Freedom

India's Struggle for Freedom is one of the important turning points in the history of India. This theme provides an insight into a phase that changed the course of India's future. The end of the 19th century and the beginning of 20th century witnessed the rise of nationalist feelings among many Indians. These feelings ultimately led to the birth of Indian National Movement. The foundation of Indian National Congress marked the beginning of an organised political movement by Indians. The politically active Indians expressed their dissatisfaction with the exploitation of Colonial rule in India that gradually gained the momentum for the demand of self-rule. Mahatma Gandhi adopted the unique method of protest based on Satyagraha and Non-Violence that finally led the country to its independence. This theme will enable children to understand and appreciate the contributions and the sacrifices made by our nationalist leaders for the sake of freedom of our country.

Learning outcomes:

Children will be able to:

- ☑ define nationalism and identify factors giving rise to nationalism;
- ☑ state the objectives of the Indian National Congress;
- ☑ discuss and comprehend the methods and demands of the moderates;
- ☑ appreciate the ideas of Nationalism and Swadeshi;
- ☑ identify the significance of the Home Rule Movement and the Lucknow Pact;
- ☑ discuss various campaigns initiated by Gandhi;
- ☑ explain the various factors responsible for the launching of Non-Cooperation and Civil Disobedience movement and Quit India movement;
- ☑ discuss the impact of the mass movements;
- ☑ analyse the objectives of Forward Bloc and the INA;
- ☑ examine the various clauses of the Indian Independence Act;
- ☑ appreciate and reflect on the sacrifices made by our national heroes.

India's Struggle for Freedom

Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
<p>Phase 1</p> <ul style="list-style-type: none"> ➤ Rise of nationalism – factors- economic exploitation, spread of western education, role of the Press, repressive policy of Lord Lytton (to be covered briefly) ➤ Early political associations – The Indian National Congress (formation and objectives), The Moderates- leaders, methods, demands Partition of Bengal- only the Anti Partition 	<ul style="list-style-type: none"> ➤ Building on children's previous learning. ➤ Providing opportunities for children to share their experiences and views on the theme both individually and in groups. ➤ Organising discussions on: <ul style="list-style-type: none"> ☛ Factors giving rise to nationalism with special reference to the role of the press. ☛ Ideas of Swadeshi and Boycott. ☛ Emergence to Gandhi as a leader of the masses. ☛ Ahimsa and Satyagraha ☛ Split and Rule policy of the British ☛ Mind mapping of causes, events and impact of the mass movements. 	<ul style="list-style-type: none"> ➤ Movie on Mahatma Gandhi and S.C Bose. ➤ Class assembly depicting-mass movements of Mahatma Gandhi ➤ Collage/charts on the contribution of Mahatma Gandhi. ➤ Case study. ➤ Flow Chart. ➤ Videos. ➤ Documentaries on Freedom Struggle, experts/Historians/Freedom Fighters. ➤ Projects.

India's Struggle for Freedom

Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
<p>Movement-Swadeshi and Boycott to be covered briefly, Surat split- a brief understanding.</p> <p>Phase 2</p> <ul style="list-style-type: none"> ➤ Home Rule Movement- leaders and objectives, Lucknow Pact (1916)- as Unity Pact (a brief understanding). ➤ Gandhian Era (1917 – 1947). ➤ Early campaigns- Kheda, Champaran, Ahmedabad (a brief description). ➤ Mass Movements-Non-cooperation (causes, withdrawal, impact), Rowlatt Act, Jallianwala, Khilafat (Chauri-Chaura). ➤ Civil Disobedience Movement (causes) Simon Commission, Lahore Session Quit India-Forward Bloc and INA (objectives only) Independence and partition – Cabinet Mission Plan, Mountbatten plan, Indian Independence Act (only clauses). 	<ul style="list-style-type: none"> ➤ Preparing a project on the role of the press in the rise of nationalism in India. ➤ Audio Visuals/documentaries on: <ul style="list-style-type: none"> ☛ the role of Subhash Chandra Bose or other freedom fighters in the freedom struggle. ☛ The mass movements of Mahatma Gandhi. ➤ Written Assignments on: <ul style="list-style-type: none"> ☛ Preparing a project report on the 'Role of Mahatma Gandhi in the freedom struggle'. ☛ Preparing a flow chart of important dates and events in the national movement. ☛ The contribution of local leaders in the National movement. ☛ Preparing a Flow chart of important dates. ➤ Making a Case Study on: <ul style="list-style-type: none"> ☛ Mohammad Ali Jinnah and the demand for Pakistan. ☛ Partition and its impact. ☛ Subhash Chandra Bose and the forward block. ➤ Organising visits/ trips to: <ul style="list-style-type: none"> ☛ Public libraries. ☛ museums and Archives. ☛ historical places related to the freedom movement. ➤ Conducting a seminar and inviting resource persons to reinforce learning concepts about related issues. ➤ Organising a class assembly on the Role of Mahatma Gandhi in the Freedom Struggle. ➤ Tracing the important sessions of the Congress on the map of India. ➤ Enactment/ role plays by children on: <ul style="list-style-type: none"> ☛ The life of Mahatma Gandhi, Netaji Subhash Chandra Bose, Sardar Vallabhai Patel, etc. ☛ The famous movements of Mahatma Gandhi. ➤ Depicting the Anti-partition movements i.e. Swadeshi & Boycott. 	

Theme 1: The Three main Organs of the Indian Government: Legislature, Executive, Judiciary

The Legislature, Executive and the Judiciary form the main organs of governance in India. The Union Legislature is entrusted with the task of making laws. Similarly, the Union Executives are entrusted with the task of enforcing laws throughout the country. The Legislature includes Lok Sabha and Rajya Sabha, whereas the Executive includes the President, the Vice-President and the Prime Minister and the other Ministers. The Judiciary is the third branch or the pillar of the Indian democratic setup. This theme will enable children to understand the nature and functions of the government of their country.

Learning outcomes:

Children will be able to:

- ✓ discuss the composition of the Indian parliament - the Lok Sabha and Rajya Sabha;
- ✓ compare and understand the working of the Lok Sabha and the Rajya Sabha;
- ✓ describe the relation between the two houses;
- ✓ explain the powers and the functions of the Union Parliament;
- ✓ state the qualifications, elections, powers and functions of the President, Prime minister and Council of ministers;
- ✓ discuss the composition of the Supreme court and High court and state the qualifications and appointment of judges to the Supreme court and High court;
- ✓ highlight the powers and functions of Judges of the supreme court and high courts;
- ✓ discuss the concept of judicial review and court of record;
- ✓ explain the term 'writ' giving examples.

The Three main Organs of the Indian Government: Legislature, Executive, Judiciary

Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Legislature – Lok Sabha and Rajya Sabha, composition, term, election, qualifications, Presidency officer. Powers & functions of the Union Parliament. ➤ Executive – The President, The Vice-President, Prime Minister and Council of Ministers- qualifications, election (method not procedure) powers and functions. ➤ The Judiciary– The Supreme Court and High Court – Composition, qualifications of judges, appointment, Jurisdiction and functions: Original, Appellate, Revisory, Judicial Review, Court of Record, Writs, what are Writs-few examples 	<ul style="list-style-type: none"> ➤ Organising discussions with children on: <ul style="list-style-type: none"> ☛ The composition and working of the Union Parliament. ☛ The Composition of the Supreme Court and High Court, qualifications of the President, the Prime minister and the Council of ministers. ☛ Powers and functions of the Union parliament. ➤ Conducting Visits/Field Trips to: <ul style="list-style-type: none"> ☛ The Rashtrapati Bhawan, Supreme Court, Parliament House, etc. to facilitate a better comprehension. ☛ To the State Assembly House/ High Court/ Local Courts to understand the functioning of the Judiciary. ➤ Conducting a Mock Court session to know about the working of the Judiciary. ➤ Planning and organising a “Mock Parliament” to explain the working of the Parliament. 	<ul style="list-style-type: none"> ➤ Audio-visual aids. ➤ Clippings of newspapers and magazines. ➤ Rashtrapati Bhawan. ➤ Parliament in session. ➤ Local Courts.

Theme 2: United Nations

The beginning of the 20th century witnessed World War I, the horror and tragedy of which devastated the world. There was an overwhelming desire for an end to the war and an establishment of peace and security in the world. The United Nations was formed for this purpose in 1945. Some other objectives of UN organs and agencies that work together is to improve the lives of poor people, to eradicate hunger, disease and illiteracy and to encourage mutual respect for each other's right and freedoms. This theme will help children appreciate the role and services of United Nations.

Learning outcomes:

Children will be able to:

- understand and describe the aims and principles of the United Nations(U.N.);
- outline the organs of the U.N.;
- discuss the composition of the General Assembly, Security Council and the International Court of Justice;
- highlight the functions of the U.N. Agencies (UNESCO, UNICEF, WHO);
- appreciate the role and services provided by U.N. Agencies.

United Nations		
Key Concepts / Concerns	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Aims and Principles, Organs (all SLR mention in brief)- General Assembly, Security Council, International Court of Justice (detail) – Composition and functions. ➤ Agencies of UN – UNESCO, UNICEF, WHO – functions only. 	<ul style="list-style-type: none"> ➤ Carrying out survey on the functioning of the UN ➤ Preparing Bulletin Boards-agency of UN ➤ Organising discussions on: <ul style="list-style-type: none"> ☛ The aims and principles of the United Nations. ☛ The composition and functions of Different Organs of the UN. ➤ Writing a report on the working of WHO on eradication of life threatening diseases in the world. ➤ Model making on: Any one heritage site under protection from the UNESCO. ➤ Analysing the work done by the UNICEF in providing clean and safe drinking water to children of developing countries. ➤ Conducting a role Play based on a Model United Nation “MUN” for a first-hand experience. ➤ Showing short documentaries on the UNICEF, WHO, ILO, UNESCO. 	<ul style="list-style-type: none"> ➤ Audio-visual aids. ➤ Project work-research work/making report on eradication of Zika & Ebola viruses

Geography



The Geography Curriculum deals with the development of children's understanding and appreciation of the world through a continuous interaction and exploration of the natural and human environment. It aims at encouraging children to appreciate the interdependence of individuals, groups and communities and promotes a healthy respect for different types of cultures and ways of life of people around the world. The curriculum brings about a focus on developing geographical skills that enables children to make informed judgements at local, national and international levels. It brings to the fore the influence of Geographical phenomenon in terms of changes in temperature, climate and weather, availability of resources and material etc. and their impact on our daily lives.

Core concepts of Geography for Classes VI-VIII are as under:

Class VI

Representation of
Geographical
Features

Landforms

Water Bodies

Agriculture

Minerals

Study of Continents:
North America
and
South America

Class VII

Representation of
Geographical
Features

Atmosphere

Weather and Climate

Weathering and Soil
Formation

Industries

Energy and Power
Resources

Study of Continents:
Europe, Africa,
Australia, Antarctica

Class VIII

Representation of
Geographical
Features

Population Dynamics

Migration

Urbanisation

Natural and
Man-made disasters

Asia: The Largest
Continent

India: Geographical
Features

India - Human
Resources

Theme 1: Representation of Geographical Features

Topographical sheets or top sheets are large scale maps. On these maps various features (natural or human made) are represented by conventional symbols and colours, which have already been discussed in previous classes. In this class children will be introduced to contours and enabled to interpret toposheets on the basis of contours and features represented through symbols and colours. Children will also develop the ability to represent landforms such as valleys, hills, plateaus, etc. through contours on plain sheets.

Learning outcomes:

Children will be able to:

- ☑ read contours on toposheets;
- ☑ distinguish between steep and gentle slopes through contours;
- ☑ identify landforms through contours on the toposheet;
- ☑ differentiate patterns of settlements on the toposheet;
- ☑ draw contours and related landforms on plain paper;
- ☑ interpret and analyse the toposheets.

Representation of Geographical Features

Key Concepts	Suggested transactional processes	Suggested Learning resources
<p>On the basis of Topographical Sheet:</p> <ul style="list-style-type: none"> ➤ Interpret contours on the sheet (height, shape). ➤ Identify landforms through contours. <ul style="list-style-type: none"> ☛ Types of slopes (steep, gentle). ☛ Hills, Plateaus, Ridges (gap, saddle, col, pass). ➤ Settlement patterns: <ul style="list-style-type: none"> ☛ Temporary and permanent ☛ Nucleated, dispersed and linear ➤ Interpret and analyse the given toposheet. 	<ul style="list-style-type: none"> ➤ Providing examples of landforms through visuals, models or diagrams to children in order to explain contour patterns. ➤ Showing Satellite images from the different parts of the world and using them to analyse settlement patterns, by children. 	<ul style="list-style-type: none"> ➤ Visuals. ➤ Toposheets. ➤ Atlas and maps. ➤ Internet resources.

Integration: Mathematics, Arts Education

Life Skill: Using a topographical sheet

Theme 2: Population Dynamics

The theme aims at enabling children to understand the causes of population growth in different parts of the world. They will also be able to comprehend terms such as birth rate, death rate, population density, migration, etc. A case study approach will help in developing children understanding about the impact of high growth rate of population on socio-economic development of the region.

Learning outcomes:

Children will be able to:

- describe the factors affecting the population of a place;
- identify over and under populated countries in the world;
- analyse the impact of over and under population on society;
- interpret a population pyramid showing composition of the population on the basis of age and sex.

Population Dynamics		
Key Concepts	Suggested transactional processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Distribution of population in the world. ➤ Overpopulation and under population: meaning with examples of countries from the world. ➤ Impact of overpopulation and under population on the society. ➤ Factors affecting the population of a place, birth and death rate, immigration and emigration. ➤ Composition of population – Age and sex, rural and urban; population pyramid. 	<ul style="list-style-type: none"> ➤ Demonstrating the effect of increasing/ decreasing population by including more/less children in one classroom, followed by a discussion. ➤ Organising a debate and encouraging children to participate to give their views on the impact of the population growth on economic development of the country. ➤ Conducting a survey by children in groups to collect data of children in their school on the basis of their age and gender and construct a population pyramid diagram. ➤ Project work on Environmental effects of population growth ➤ Case Study on: A country which is over populated/ underpopulated 	<ul style="list-style-type: none"> ➤ Population data from internet, journals, newspapers, etc. ➤ Clay or paper mesh method to make population pyramids. ➤ Report of the Census(www.census.gov). ➤ Collection of Movies/documentaries/story, flash cards, visuals, maps, atlas. ➤ Project Work ➤ Case Study

Life Skills: Co-operation

Integration: Mathematics, History, Languages

Theme 3: Migration

Human movement from one place to another for different purposes is the focus of this theme. Children will be made aware of the types of migration and its impact on the socio-economic development of the area.

Movement of highly skilled and qualified persons to different parts of the world for better opportunities has been a cause of concern for India. This theme will enable children to understand and investigate the issues related to brain-drain in India and its impact on society.

Learning outcomes:

Children will be able to:

- differentiate the terms - immigration and emigration;
- explain reasons for migration from and to any area;
- analyse impact of migration on any area;
- identify regions of the world where huge migration took place during historical period.
- explain the meaning of brain-drain;
- identify causes of brain drain in India;
- analyse the positive and negative impact of brain- drain in India.

Migration		
Key Concepts	Suggested transactional processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Migration: Introduction. ➤ Types of migration- immigration, emigration, rural- urban and urban-urban. (examples from the world). ➤ Impact of migration on socio-economic structure of the society (examples from India and the world). ➤ Brain Drain: introduction, causes of brain-drain, positive and negative impacts of brain- drain. 	<ul style="list-style-type: none"> ➤ Showing an audio-visual/ movie /documentary or telling a story on migration. ➤ Initiating a discussion (based on the movie/ story) with children to analyse the impact of migration or brain drain. ➤ Joining the dots /treasure hunts to know the history of migration. ➤ Organising a class discussion on the problems of refugees. ➤ Collecting information about brain -drain from various sources e.g. newspapers, journals, magazines, internet, etc. and facilitating a discussion or debate. ➤ Case Study on positive and negative impacts of migration 	<ul style="list-style-type: none"> ➤ Movies/documentaries/stories, flash cards, visuals, maps, atlas. ➤ Newspapers, magazines, journals, web resources, etc. ➤ Case study <div style="text-align: center; margin-top: 20px;">  </div>

Integration: Mathematics, History, Languages

Theme 4: Urbanisation

The aim of the theme is to enable children to understand the concept of urbanisation, its causes and effects. They will also be able to relate the knowledge gained in the previous theme to understand how rapid increase in urbanisation in the world is one of the major causes of migration.

Learning outcomes:

Children will be able to:

- describe the term urbanisation;
- identify causes of urbanisation;
- describe impacts of urbanisation;
- differentiate a smart city from any other urban centre;
- explain strategies/ steps taken at the local level to keep the urban areas clean.
- Discuss ways to reduce negative impact of urbanisation.

Urbanisation		
Key Concepts	Suggested transactional processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Urbanisation – meaning and causes. ➤ Positive and negative impacts of urbanisation; satellite cities. ➤ Concept of Smart Cities (examples from the World). 	<ul style="list-style-type: none"> ➤ Organising a field trip to study the functions of the municipal corporations and understand the problems related to population growth, urbanization and public utility services. ➤ Facilitating a discussion to compare the life in a village and in a city. ➤ Conduct a brainstorming session /class discussion on the relationship between technological development, skilled human resource and urbanisation. ➤ Discussing strategies to reduce negative impact of urbanisation. ➤ Project Work on smart cities to be developed in India. 	<ul style="list-style-type: none"> ➤ Movies/documentaries/stories, flash cards, visuals, maps and an atlas. ➤ Discussions ➤ Research ➤ Project Work

Integration: Mathematics, History, Languages

Life Skills: Co-operation



Theme 5: Natural and Man-made Disasters

The aim in this theme is to enable children to build on knowledge gained in previous classes. Children will get an opportunity to study selected disasters in greater detail through case studies and will also learn about disaster management and the role of the Government in disaster management.

Learning outcomes:

Children will be able to:

- differentiate between natural and manmade disasters;
- discuss the importance of disaster management;
- demonstrate (through drills) measures to be taken in case of an earthquake, flood, fire;
- describe the causes, effects and impact of floods, earthquakes and oil spills on life and environment.
- list measures to be taken to prevent disasters.

Natural and Man-made Disasters		
Key Concepts	Suggested transactional processes	Suggested Learning resources
<ul style="list-style-type: none"> ▶ Natural and manmade disasters: Meaning and examples. ▶ Disaster management and its importance (in general); safety measures to be taken in case of floods, earthquake and fire. ▶ Role of the government in disasters and its management. <p>Case Studies:</p> <ul style="list-style-type: none"> ▶ Floods in Assam/Bihar (Causes, effects, impacts on life and environment). ▶ Earthquake in Nepal (2014): (Causes, effects, impacts on life and environment). ▶ Oil Spills-Coastal areas of the United States: (Causes, effects, impacts on life and environment). 	<ul style="list-style-type: none"> ▶ Building on children’s previous learning. ▶ Providing opportunities to children to discuss the impact of recent/known natural and man-made disasters. ▶ Conducting a Mock drill/ Role play on disaster preparedness. ▶ Collecting information about disasters from newspapers, internet sources and discussing the various disasters and their implications on life and people. ▶ Encouraging children to take initiatives to create an awareness among people in their own locality about disaster preparedness. ▶ Organising mock drills of providing first aid. ▶ Discussing the lessons learnt from past disasters and listing corrective measures 	<ul style="list-style-type: none"> ▶ Documentary films on different types of disasters. ▶ Visuals, articles from newspapers, journals and magazines. ▶ Case Study ▶ Internet. ▶ Mock drills ▶ Discussions <div style="text-align: center; margin-top: 20px;">  </div>

Integration: Biology, Languages

Life Skills: Environmental conservation

Theme 6: Asia: The Largest Continent

In the previous class, as a part of the Study of Continents, children have already been given an overview of North America, South America, Europe, Africa, Australia and Antarctica. In this class children will be introduced to the largest continent - Asia. Asia is the largest and the most populous continent in the world. The purpose of introducing this theme is to enable children to understand the physical features and the natural environment of Asia.

Learning outcomes:

Children will be able to:

- identify countries of Asia on the globe and on the world map;
- locate physical features e.g. important mountains, plateaus, deserts, rivers, lakes, islands. on the map of Asia;
- describe the impact of latitudinal extent and distinct relief features on the climate of Asia;
- analyse interrelationship between climate and natural vegetation found in the different regions of Asia.

Asia: The Largest Continent		
Key Concepts	Suggested transactional processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Location and Extent ➤ East Asia, North Asia, Central Asia, South-East Asia, South-Central Asia, Western Asia ➤ Physiography: Northern lowlands, Central highlands, Plateaus, River basins, Islands. ➤ Climate: Factors affecting Climate of Asia, Types of Climate: Tundra, Temperate, Tropical, Desert, Equatorial. ➤ Natural Vegetation and Wildlife, Tundra, Taiga, Tropical Deciduous, Thorny, Equatorial. 	<ul style="list-style-type: none"> ➤ Engaging children in group activity to locate the physical features on the map of Asia. ➤ Using audio - visual materials to highlight geographical and cultural differences in different parts of Asia. ➤ Promoting children's participation to draw an interrelationship between latitudes, relief, climate and vegetation found in different parts of Asia. 	<ul style="list-style-type: none"> ➤ Maps. ➤ Atlas. ➤ Clay and /or papier mache. ➤ Flow chart and/or tables. ➤ Web resources and scrap books. ➤ Audio-visual materials.

Integration: Biology, Languages

Life Skills: Environmental Conservation

Theme 7: India: Geographical Features

The theme aims to build on children's previous knowledge of Class VI and focus and develop a more in-depth understanding of one country in Asia i.e. India.

Learning outcomes:

Children will be able to:

- interpret location and extent of India with reference to other countries of Asia;
- locate important mountains, plateaus, deserts, islands, rivers on the map of India;
- compare the relief, climate and vegetation of India with other parts of Asia;
- discuss the importance of monsoon and its impact on the socio-cultural unity of India.

India: Geographical Features

Key Concepts	Suggested transactional processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ India- Its location and extent, its neighbouring countries. ➤ Political divisions of India – States/ UTs and Capitals. ➤ Physiographic Divisions of India –The Himalayas, Northern plains, Peninsular plateau, Thar desert, Coastal regions, Islands. ➤ Conservation of Forest and wildlife in India. ➤ National parks, biosphere reserve, wildlife sanctuaries. ➤ Climate and Natural vegetation: <ul style="list-style-type: none"> • Factors affecting climate, Monsoon. • Types of Natural vegetation: Tropical rain forest, deciduous forest, thorny, Tidal Forest, Montane forest. 	<ul style="list-style-type: none"> ➤ Organising quizzes to locate places and physical features on the map of India. ➤ Encouraging children to draw an interrelationship between the relief, climate and natural vegetation available in different parts of India. ➤ Giving project work on different types of natural vegetation and their importance. ➤ Discussing the importance of conserving the natural vegetation with children. ➤ Discussing and explaining the mechanism of monsoon in India. ➤ Discussing the role of the Monsoon in the socio-cultural unity of India. 	<ul style="list-style-type: none"> ➤ Maps. ➤ Atlas. ➤ Web resources and scrap books. ➤ Projects. ➤ Quizzes. ➤ Discussions

Integration: Biology, Physics

Life Skills: Environmental Conservation



Theme 8: India: Human Resources

This theme aims at introducing and making children aware of the concept of people as resources for the socio-economic development of the country. Children will be made aware that a healthy, educated and skilled human being is an asset for the country. Children will also be enabled to investigate areas of the World/India where natural resources are not being used properly without skilled humans.

Learning outcomes:

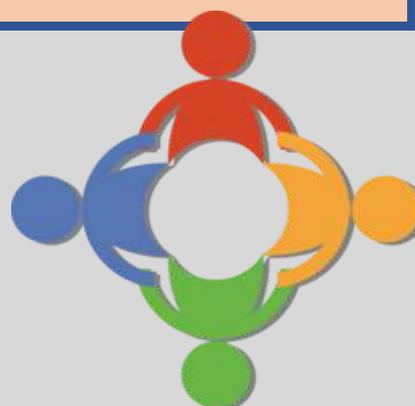
Children will be able to:

- discuss the meaning of human resource;
- describe the role of health and education in developing human resources;
- understand the meaning of skilled and unskilled human resource;
- identify areas in India lagging behind in development due to unavailability of unskilled human resource;
- analyse factors responsible for development of any area.

India: Human Resources		
Key Concepts	Suggested transactional processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Human resources – meaning. ➤ Distribution of population in India (rural urban, geographical distribution, sex ratio). ➤ Role of health and education in developing human resources (to be done briefly) ➤ Skilled and unskilled human resource (meaning and examples only). ➤ Impact of skilled human resource on the socio-economic development of the country (examples from India). 	<ul style="list-style-type: none"> ➤ Familiarising children with the different skills related to employment. ➤ Encouraging children to define aspects of population in terms of: - rural, urban, male, female etc. ➤ Explaining the meaning of skilled and unskilled human resources with relevant examples. 	<ul style="list-style-type: none"> ➤ Newspapers, magazines, journals, maps, web resources, etc. ➤ Graphs, statistical data

Integration: Mathematics, Languages, Biology

Life Skills: Understanding the potential of humans as resources



SCIENCE

Science



Science is an organised body of knowledge about physical and biological environment around us. It has developed out of our attempt to understand things and events in nature, through systematic observation. Science is dynamic in nature, with many old concepts being modified or discarded with the advent of new findings. Science is also multidimensional.

For a long time, the emphasis of teaching-learning of Science has been on only one dimension, that is, the content of Science. However, over the years, researches in Science education have improved our understanding of Science and Science education. According to Prof. Robert E. Yager, Emeritus Professor of Science Education, University of Iowa, USA, Science consists of six domains: Concepts, Processes, Applications, Attitudes, Creativity and Worldview (Nature of Science).

(i) Concept Domain: It includes facts, concepts, laws or principles, hypotheses and theories. Understanding of these concepts is important for successful teaching and learning. These concepts are further classified and organised into different topics. For example, matter, energy, plant development, animal behaviour. As Science develops, our understanding about things and events in nature grows, new concepts are added; old ones are sometimes redefined or rejected. In fact, this domain presents our current understanding of a particular subject or topic.

(ii) Process Domain: “Experiment is the sole source of truth”, wrote Henry Poincare in his famous book, *Science and Hypothesis* (1905). Scientists use processes to investigate. Some processes are: Observing and describing, classifying and organising, measuring and charting, communicating, predicting and inferring, hypothesizing, hypothesis testing, identifying and controlling variables, interpreting data, constructing instruments, simple devices and physical models. Development of process skills among children is a primary aim of Science education. This helps them to understand Science or investigate a problem scientifically. Hands-on/minds-on activities have been integrated in the Science curriculum so that children master these process skills.

(iii) Creativity Domain: Scientific activities related to this domain include: visualizing - producing mental images, combining objects and ideas in new ways, producing alternative and unusual uses for objects, solving problems and puzzles, designing devices and machines, and producing unusual ideas. Creativity is required when we attempt to answer, “what, how and why”

about things or events around us. Special efforts should be made to provide opportunities to children which bring out creativity in them.

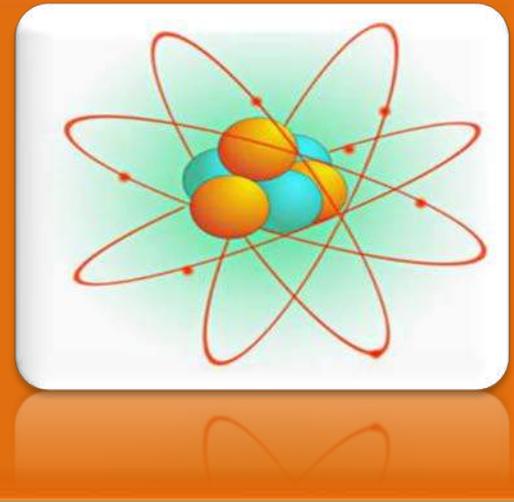
(iv) Attitude Domain: This domain includes developing positive attitudes towards Science in general; development of positive attitude towards oneself (as “I can do it” attitude), exploration of human emotions, develop sensitivity to, and encourage respect for the feeling of other people, expression of personal feelings in a constructive way, decision- making about personal values and decision- making about social and environmental issues. A positive attitude towards Science not only helps children in learning Science but also encourages them to seek answers for their own problems. ‘Attitude towards Science’ is not the same as ‘Scientific attitude’. The latter refers to ‘open-minded’, ‘honesty’ or ‘scepticism’.

(v) Application Domain: Children should be able to apply learning of Science in new situations. This includes recognising instances of scientific concepts in everyday life experiences; application of science concepts and skills learnt to everyday technological problems; understanding scientific and technological principles involved in common technological devices; using scientific processes in solving problems that occur in everyday life; understanding and evaluating mass media reports of scientific developments; making decision related to personal health, nutrition and life-style based on knowledge of scientific concepts rather than on hearsay and emotions; integrating science with other subjects (interdisciplinary). Science knowledge must be associated with the social and living experiences of children.

(vi) Worldview Domain: Teaching-learning of Science should present the nature of Science, as a whole. The development of Science is through the process of validating old concepts, discarding/modifying old concepts based on new experimental evidences and evolving theories to explain different phenomena. This domain should help children develop understanding of the ways in which the scientific knowledge is created; the nature of research processes; the meaning of basic concepts of scientific research (e.g., hypothesis, assumptions, controls, replication); the history of development of scientific ideas; the ways scientists work, organise and work as a team; the interaction among science, economics, politics, history, sociology, philosophy.

The present science curriculum follows a disciplinary approach. Science has been presented as Physics, Chemistry and Biology. Instructional material and teaching-learning processes in each subject, should pay due attention to all six domains of Science, as described above.

Physics



Physics is the study of matter, energy and its interactions. It attempts to explain how nature works using the language of mathematics. Physics generates fundamental knowledge which is needed for the future technological advancements. Study of Physics is essential for inspiring young children and expanding their knowledge of other disciplines.

The Core concepts of Physics for Classes VI – VIII are as follows:

Class VI

Matter
Physical Quantities
and Measurement
Force
Energy
Light
Magnetism

Class VII

Physical Quantities
and Measurement
Force and Pressure:
Motion
Energy
Light Energy
Heat
Sound
Electricity and
Magnetism

Class VIII

Matter
Physical Quantities
and Measurement
Force and Pressure
Energy
Light Energy
Heat Transfer
Sound
Electricity

Theme 1: Matter

Building on previous learning in Classes VI and VII, in this class the theme aims at introducing children to the Kinetic Theory which will help them in understanding the difference in the three states of Matter. The theory states that all matter is made of tiny particles which in an object are always in motion that may move slow or fast. In solids, the particles have less energy hence do not move around freely. In liquids, they have relatively more energy and move about freely within the container. The particles of gases have much more energy and move freely at high speeds. The increase or decrease in the movement of energy is the result of heating or cooling of an object. Heating an object increases the energy of particles whereas cooling decreases the energy of particles of an object.

Learning outcomes:

Children will be able to:

- ☑ distinguish the three states of matter in terms of movement of particles;
- ☑ relate the three states of matter with energy of movement of particles in them;
- ☑ describe the change of state using Kinetic theory:
 - ☛ Boiling
 - ☛ Vaporization
 - ☛ Melting
 - ☛ Fusion
 - ☛ Evaporation
 - ☛ Condensation
 - ☛ Sublimation
 - ☛ Deposition
 - ☛ Freezing
- ☑ identify appropriate observable parameters in experiments;
- ☑ collect data and make careful observation;
- ☑ present the results in the form of tables;
- ☑ consider results using scientific knowledge and communicate these.

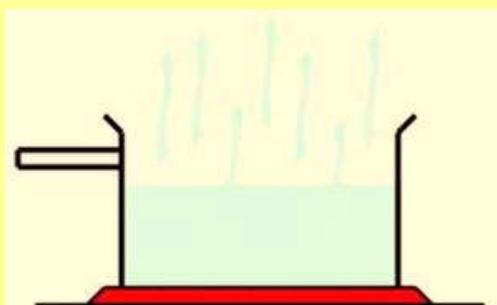
Matter		
Key Concepts	Suggested Transactional Processes	Suggested Learning resources
Kinetic Theory of Matter. ▷ Three states of matter in terms of movement of particles. ▷ Energy content in the three states of matter. ▷ Change of state in matter using the Kinetic theory: <ul style="list-style-type: none"> ☛ Boiling ☛ Vaporization ☛ Melting ☛ Fusion ☛ Evaporation 	▷ Revising previous concepts learnt by children. ▷ Building on children's previous learning. ▷ Demonstrating matter in three states. ▷ Demonstrating change of state, solid to liquid, liquid to gas, etc. ▷ Demonstrating the phenomenon of melting and boiling. ▷ Engaging children in undertaking activities related to melting and boiling, condensation and freezing and	▷ Samples of three states of matter ▷ A beaker ▷ Tripod stand with mesh ▷ Burner ▷ Thermometer ▷ Laboratory stand ▷ Naphthalene balls ▷ Videos on states of matter and change of state

Matter

Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ☛ Condensation ☛ Sublimation ☛ Deposition ☛ Freezing ➤ Change of state diagrams (using the terms mentioned above). 	<p>making observations followed by discussion.</p> <ul style="list-style-type: none"> ➤ Engaging children (individually /in groups) to observe change of state; solid to liquid, liquid to gas and record what is observed. ➤ Explaining different terms, such as, boiling, melting, freezing, condensation, sublimation, etc. with examples from daily life. ➤ Observation of above mentioned phenomena in possible classroom situations (using different samples) ➤ Children observing solids and liquid (Compare and contrast the physical characteristics). ➤ Encouraging children to prepare a comparison table of different states based on (shape, texture and volume). ➤ Asking children to describe the interconversion of states using examples like water, naphthalene balls etc. and additional examples of all types of change of state. ➤ Engaging children in pairs or in small groups in investigation of the related change of state due to addition of energy (heating) or cooling due to a substance. ➤ Engaging children (individually/ in groups/in pairs) in the design of activities to show that melting or boiling occurs at a fixed temperature for a substance. 	

Integration: Chemistry, Geography, Technology in daily life.

Life Skills: Cooperation and working together, Problem-solving.



Theme 2: Physical Quantities and Measurement

Previous learning demonstrated the measurement of the density of regular solids. In this class children will develop the ability to measure the, density of an irregular solid and also of a given liquid. They will also understand that due to the difference in the value of densities of a solid and liquid, a piece of solid can float or sink in a liquid.

Learning outcomes:

Children will be able to:

- ☑ measure density of an irregular solids;
- ☑ measure density of a liquid;
- ☑ discuss the concept of floatation based on relative densities of solid and liquid;
- ☑ express result of measurement in proper unit with proper symbol;
- ☑ solve simple numerical problems based on formula of density;
- ☑ compare densities of matter in three states, solid, liquid and gas;
- ☑ make careful observations including measurements;
- ☑ gather data using formal units;
- ☑ make conclusions from collected data;
- ☑ make predictions using scientific knowledge and effectively communicating the same.

Physical Quantities and Measurement

Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Measurement of Density of irregular solids using: <ul style="list-style-type: none"> ☛ Eureka Can ☛ Measuring Cylinder ➤ Measurement of Density of Fluids: <ul style="list-style-type: none"> ☛ Basic Concept ☛ Concept of Floatation and sinking of a substance (relate to density) ☛ Comparison of densities in the three states of matter. 	<ul style="list-style-type: none"> ➤ Revising previous concepts learnt by children. ➤ Building on children's previous learning. ➤ Demonstrating the process of measurement of density of an irregular solid. ➤ Demonstrating the process of measurement of density of a liquid ➤ Engaging children in practical tasks involving measurement of density of an irregular solid and a liquid ➤ Engaging children (in groups/pairs/individually) in an investigation to find out which object floats in which liquid, given solids of different densities and liquids of different densities. This is to be followed by discussion. ➤ Guiding children to predict the result of the previous investigation and comparing predictions with the outcomes. 	<ul style="list-style-type: none"> ➤ Graduated cylinder ➤ Eureka can ➤ Graduated beaker ➤ Water ➤ Objects of different densities ➤ Liquids of different densities ➤ Balance to measure mass ➤ Objects of irregular shapes ➤ Video on volume measuring devices ➤ Video on determination of density of solid and liquid

Life Skills: Cooperation and working together, Problem-solving.

Integration: Chemistry, Technology in daily life.

Theme 3: Force and Pressure

A force is a push or pull upon an object resulting from the object's interaction with another object. Turning effect of a force is more if the distance between the point of application of force and the pivot is more. It is given a special name, Moment of force. Pressure is defined as force per unit area. Solids, liquids and gases, all exert pressure. Atmosphere also exerts pressure.

Learning outcomes:

Children will be able to:

- ☑ explain the turning effect of a force, with examples from daily life;
- ☑ define moment of force;
- ☑ express moment of force in proper units;
- ☑ solve simple numerical problems based on moment of force;
- ☑ define pressure;
- ☑ express pressure in proper units;
- ☑ solve simple numerical problems based on formula for pressure;
- ☑ describe pressure exerted by a liquid;
- ☑ demonstrate that liquids exert pressure;
- ☑ describe pressure exerted by a gas;
- ☑ describe atmospheric pressure;
- ☑ express thoughts that reveal originality, speculation, imagination, a personal perspective, flexibility in thinking, invention or creativity;
- ☑ present ideas clearly and in logical order.

Force and Pressure

Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Turning effect of force (moment of force): concept, definition and calculation ➤ Pressure: <ul style="list-style-type: none"> ☛ Definition ☛ Unit ☛ Calculation of pressure in simple cases ☛ Pressure exerted by liquids (Qualitative only). ☛ Pressure exerted by gases- Atmospheric pressure (Qualitative only). 	<ul style="list-style-type: none"> ➤ Revising previous concepts learnt by children. ➤ Building on children's previous learning. ➤ Demonstration of turning effect of force. ➤ Explanation of turning effect and factors on which it depends. ➤ Engaging children in task for calculation of turning effect. ➤ Demonstration of pressure exerted by a force on an object. ➤ Explanation: pressure depend on the area of surface on which the force acts. ➤ Demonstration of pressure exerted by a liquid. ➤ Demonstration of pressure exerted by a gas. ➤ Explanation of pressure exerted by atmosphere. 	<ul style="list-style-type: none"> ➤ A nut fixed in an object ➤ Spanner ➤ Doors of classroom ➤ Nails ➤ Hammer ➤ Transparent glass tube or plastic pipe ➤ Rubber balloon ➤ Strong thread ➤ Water ➤ A plastic bottle with a hole bear the bottom ➤ Rubber sucker

Force and Pressure

Key Concepts	Suggested Transactional Processes	Suggested Learning resources
	<ul style="list-style-type: none">➤ Engaging children in tasks to show that:<ul style="list-style-type: none">(i) pressure depends on area(ii) liquids exert pressure(iii) gases exert pressure.➤ Observation/Experimentation/Analysis➤ Student led experiments (reasoning to be given by children individually) Investigate the effect on pressure when walking on flat shoes and pointed heels on our body support system. For e.g. Children reasoning as to- Why is it easier to hammer a sharp pin respective to a blunt pin?	

Integration: Geography, Technology in daily life.

Life Skills: Cooperation and working together, Problem-solving.

Theme 4: Energy

Building on previous learning on Energy, the emphasis in this class is on the introduction of gravitational potential energy to children. Look at a swinging bob of a pendulum. When it is at its extreme position (the highest point of its motion), it has gravitational potential energy. When it reaches its mean position (lowest point), it has maximum speed and it has high kinetic energy. In this case, one form of energy changes into other, according to the law of conservation of energy. Energy is the ability to do work. Work is said to be done when a force acting on an object changes the position of the object. For the special case when the object changes its position along the direction of the force, work is given by the product of the force and distance moved by the object. But different persons may take different time to do the same work. Rate of doing work is called power. So energy and power are two different physical quantities, having different units. In many situations, the focus is on the power and not energy. For e.g. the power of a motor which works is paid for the electricity consumed, is actually paid for the energy consumed.

Learning outcomes:

Children will be able to:

- ☑ define work;
- ☑ express work in proper unit;
- ☑ calculate work done in simple cases;
- ☑ define kinetic energy;
- ☑ express kinetic energy in proper units;
- ☑ solve simple problems based on kinetic energy;
- ☑ define potential energy;
- ☑ define gravitational potential energy;
- ☑ solve simple problems based on gravitational potential energy;
- ☑ describe energy transformation in daily life situation;
- ☑ distinguish between energy and power;
- ☑ can plan an experimental investigation or demonstration using Scientific processes;
- ☑ can identify /select on the basis of attributes.

Energy		
Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Concept of Work ➤ Unit of Work (Joule) ➤ Calculation of Work done in simple cases ➤ Kinetic Energy <ul style="list-style-type: none"> ➤ Basic Concept ➤ Potential Energy <ul style="list-style-type: none"> ➤ Basic Concept ➤ Gravitational Potential Energy ➤ Calculation of kinetic and potential energies from a set of given data (Simple problems and assuming $g=10 \text{ m/s}^2$) ➤ Energy transformation in common daily life situations 	<ul style="list-style-type: none"> ➤ Revising previous concepts learnt by children. ➤ Building on children's previous learning. ➤ Explaining concept of work done with examples from daily life. ➤ Calculating work done in simple cases and expressing result in proper unit. ➤ Explaining of kinetic energy and potential energy ➤ Explaining of gravitational potential energy ➤ Solving of problems on kinetic and potential energy 	<ul style="list-style-type: none"> ➤ Video on work done in simple cases from daily life. ➤ A simple pendulum. ➤ Video on Kinetic and potential energy. ➤ Video on transformation of energy.

Energy		
Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Difference between Energy and power 	<ul style="list-style-type: none"> ➤ Demonstrating kinetic and potential energy using a simple pendulum ➤ Engaging children in problem solving tasks on KE and PE ➤ Explaining and discussing with children energy transformation in daily life situations / activities. ➤ Explaining the difference between energy and power. ➤ Citing examples of different applications of conservation of energy (roller coaster, production of hydroelectricity etc.) with children making energy conversion diagrams and deducing that energy is conserved. 	

Integration: Technology in daily life

Life Skills: Cooperation and working together, Problem solving

Theme 5: Light Energy

An object lying at the bottom of a vessel filled with water usually appear to be at different depth than it actually is. This is due to bending of light rays when it travels from water to air. This phenomenon is called refraction. Light bends when it passes obliquely from one medium to the other. Due to refraction, a mirage is observed on a hot sandy desert. Atmosphere also refract the rays coming from the sun. This causes advanced sunrise and delayed sunset. Previous learning emphasized on reflection of light by a plane mirror. how images are formed by a curved (concave) mirror is now dwelt upon along with rules used to construct ray diagrams.

Learning outcomes:

Children will be able to:

- ☑ define refraction;
- ☑ discuss examples of refraction;
- ☑ describe a spherical mirror;
- ☑ describe a concave and a convex mirror;
- ☑ define the terms, principal axis, centre and radius of curvature, focus and focal length for a spherical mirror;
- ☑ describe rules for making ray diagrams for spherical mirror;
- ☑ distinguish between real and virtual images;
- ☑ use a ray diagram to show formation of a real image by a spherical mirror;
- ☑ describe the characteristics of a real image formed by a spherical mirror;
- ☑ describe dispersion of white light by a prism into constituent colours;
- ☑ display a scientific attitude while making models;
- ☑ show a creative mind set while studying real world optical phenomena;
- ☑ communicate logical reasoning and explanations effectively using scientific terms.

Light Energy		
Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Refraction: <ul style="list-style-type: none"> ☛ Definition ☛ Examples of Refraction. ➤ Curved Mirrors: <ul style="list-style-type: none"> ☛ Convex ☛ Concave ☛ Reflecting surface (Convex and Concave) ☛ Uses of Curved mirrors ☛ Terms related to Curved mirrors –Focus, Principal Axis, centre of curvature, radius of curvature ☛ Rules for making ray diagrams of Spherical mirrors. ☛ Real and Virtual Images 	<ul style="list-style-type: none"> ➤ Revising and revisiting previous concepts learnt by children. ➤ Building on children’s previous learning. ➤ Demonstrating the phenomenon of refraction ➤ Engaging children in pairs, individually or small groups in activities related to refraction. ➤ Explaining refraction with suitable examples. ➤ Demonstrating how concave and convex mirrors work. ➤ Representing of concave and convex mirrors through diagrams ➤ Explaining the terms i.e. Focus, principal axis, centre of curvature, 	<ul style="list-style-type: none"> ➤ A glass slab ➤ A laser pencil ➤ White sheet of paper ➤ Drawing board ➤ Drawing pins ➤ Pencil ➤ Scale ➤ Eraser ➤ A glass tumbler with water ➤ Concave mirror ➤ Convex mirror ➤ Candle ➤ Mirror stand ➤ Candle stand ➤ Match box ➤ Screen with stand ➤ A sharp pin with stand ➤ A prism

Light Energy

Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none">✦ Ray diagrams with curved mirrors where real images are formed.➤ Dispersion of white light into constituent colours.	<p>radius of curvature with the help of diagrams to children.</p> <ul style="list-style-type: none">➤ Engaging children in activities related to image formation by a concave mirror using ray diagram.➤ Explaining real and virtual images.➤ Demonstrating the dispersion of white light into component colours.	

Integration: Geography, Technology in daily life.

Life Skills: Cooperation and working together, Problem-solving.

Theme 6: Heat Transfer

In both boiling and evaporation, matter changes from liquid to gas. But the two processes are quite different. When temperature of a matter increases, the particles of the matter gain energy and move with greater speed. In evaporation, the particles at the surface escape and form gas. Other particles, inside the liquid, do not have enough energy. So the process of evaporation occurs at the surface. It happens at all temperatures. In boiling, all particles of the liquid are at the same temperature and are involved in the process. It happens in the whole volume of the liquid and it happens at a fixed temperature, particular to a liquid. But before change of states takes place due to supply of heat, there is another effect which is commonly observed. That is the expansion of matter. Matters in all form, except some exceptions, expand on heating. In solids, the effect is less, in liquids more, and in gases maximum. Classification of expansion into three types- linear, superficial and volume are explained with examples from daily life.

Learning outcomes:

Children will be able to:

- ☑ compare and contrast Boiling and Evaporation;
- ☑ describe thermal expansion of matter;
- ☑ describe, linear, area(superficial) and volume expansion;
- ☑ compare expansivity in Solids, Liquids and Gases;
- ☑ construct models based on scientific process;
- ☑ observe and cite multiple physical phenomena from one experiment.

Heat Transfer		
Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Difference between Boiling and Evaporation. ➤ Thermal Expansion: <ul style="list-style-type: none"> ➤ Linear Expansion ➤ Volume Expansion ➤ Superficial Expansion ➤ Compare expansivity in Solids, Liquids and Gases. ➤ Examples and real-world applications. 	<ul style="list-style-type: none"> ➤ Revising and revisiting previous concepts learnt by children. ➤ Building on children's previous learning. ➤ Demonstrating points of boiling and evaporation. ➤ Engaging children in tasks related to boiling and evaporation. ➤ Explaining the difference in boiling and evaporation. ➤ Demonstrating linear expansion, area expansion and volume expansion through simple experiments for children. ➤ Explaining expansion with the help of examples from daily life activities. 	<ul style="list-style-type: none"> ➤ A flask ➤ Tripod stand with mesh ➤ Burner ➤ Water ➤ Experimental set up to show linear and area thermal expansions ➤ Videos on thermal expansion

Integration: Chemistry, Technology in daily life.

Life Skills: Problem-solving, Critical thinking.

Theme 7: Sound

In the previous classes children were made aware of and enabled to understand that a sound wave is characterised by its frequency and amplitude. Parameters that focus on loudness and pitch and are commonly used to characterise sound produced by different sources were also highlighted. The loudness depends on the amplitude, hence when the amplitude of sound is large, sound is loud. Pitch is related to the frequency so when the frequency is high, the pitch is high or the sound is shrill. In this class the theme focusses on showing how sound produced by different musical instruments have different pitch and loudness.

Learning outcomes:

Children will be able to:

- relate pitch and frequency;
- understand pitch and frequency in relation to working of musical instruments. (wind, membrane and string);
- explain mono tone;
- relate loudness and amplitude;
- state the unit of loudness in decibels.

Sound		
Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Pitch and Frequency ➤ Pitch and frequency in relation to working of musical instruments. (Wind, membrane and String) ➤ Monotone ➤ Loudness and amplitude ➤ unit of loudness in decibels 	<ul style="list-style-type: none"> ➤ Revising and revisiting previous concepts learnt by children. ➤ Building on children's previous learning ➤ Explaining terms related to pitch and frequency. ➤ Demonstrating the relation between pitch and frequency ➤ Demonstrating of pitch and frequency of some common musical instruments ➤ Demonstrating monotone sound ➤ Demonstrating the relation between loudness and amplitude ➤ Explaining units of loudness i.e. decibel. ➤ Engaging children in tasks/ activities related to pitch, loudness, frequency and amplitude. ➤ Engaging children in the design of musical toys. 	<ul style="list-style-type: none"> ➤ A rubber band ➤ A metal tumbler filled with water ➤ A pencil ➤ Musical instruments ➤ Video on Pitch and loudness of sound ➤ Video on musical instruments ➤ Tuning a guitar using a programme available on the internet

Integration: Music, Technology in daily life.

Life Skills: Cooperation and working together, Problem solving

Theme 8: Electricity

In this theme the aim is to develop the ability to estimate consumption of electricity by knowing the power rating of appliances used. Children will also be able to appreciate and understand the need and importance of taking certain precautions and use of safety devices to protect themselves and others against electrical hazards. Previous learning stressed on electricity due to charges in motion, i.e. current electricity. However, objects can be charged, where charges are static not in motion. This is known as static electricity. This leads to many phenomena in nature, like lightning and thunder during rainy season. How an object that is charged may be detected using a simple device known as an electroscope.

Learning outcomes:

Children will be able to:

- ☑ describe household consumption of electricity;
- ☑ identify live wire, neutral wire and earth wire in terms of their energy and path they travel;
- ☑ describe safety components (fuses, circuit breakers);
- ☑ describe phenomenon of static electricity;
- ☑ explain conservation of charges;
- ☑ describe conduction and induction of charges;
- ☑ describe construction and working of an electroscope;
- ☑ describe a lightning conductor;
- ☑ identify dangers of electricity;
- ☑ conduct scientific experiments keeping in mind all the parameters;
- ☑ study the impact of energy consumption and draw conclusions from the same and suggest alternate approaches;
- ☑ learn the use of safety precautions while dealing with electrical appliances.

Electricity		
Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Household consumption of electric energy (kilowatt hour) ➤ Identify live wire, neutral wire and earth wire in terms of their energy and path they travel ➤ Safety components (fuses/circuit breakers (Qualitative approach only)/ grounding) ➤ Static Electricity <ul style="list-style-type: none"> ☛ Conservation of charges ☛ Conduction ☛ Induction ☛ Electroscope (Gold Leaf Electroscope) ☛ Lightning Conductor 	<ul style="list-style-type: none"> ➤ Revising and revisiting previous concepts learnt by children. ➤ Building on children's previous learning ➤ Calculating energy consumption using household electricity bills by children. ➤ Helping children identify live, neutral and earth wires ➤ Demonstrating safety components and their uses ➤ Demonstrating static electricity ➤ Demonstrating induction and conduction ➤ Engaging children in activities related to static electricity ➤ Demonstrating the construction and working of an electroscope 	<ul style="list-style-type: none"> ➤ Household appliances with rated power ➤ Household electricity bill ➤ Fuses and circuit breakers ➤ Balloons ➤ Threads, Laboratory stands ➤ Video on electricity and safety measures ➤ Interactive Video on static electricity ➤ Interactive video on lighting conductor

Electricity

Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none">➤ Battery as a collection of cells connected in series.➤ Dangers of electricity	<ul style="list-style-type: none">➤ Engaging children in design of a simple electroscope➤ Demonstrating the functioning of a battery➤ Explaining a lightning conductor and its use➤ Explaining the dangers of electricity and the safety precautions required	

Integration: Geography, Technology in daily life.

Life Skills: Problem solving, Critical thinking.

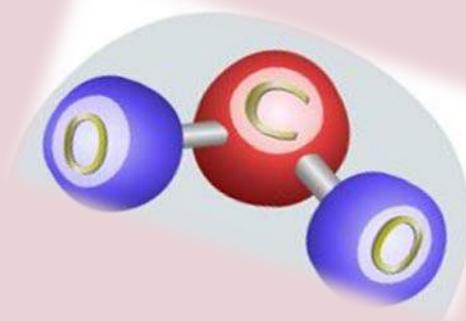
Chemistry



Chemistry is an important branch of Science which is related to the study of composition, structure, properties, reactions, synthesis and uses of different materials. Chemistry forms an integral part of general science at the primary level. However, due to a vast number of terms, facts, concepts, laws, theories, principles, processes and applications, it has been taken up as an independent subject from the upper primary level. Children at the primary level can recognise and recall tangible objects. However, at the upper primary level they start to establish cause-effect relationships, which forms an essential component of the study of the subject.

While teaching the subject at the upper primary level, the historical perspective of the development of Chemistry and the scope of career options should be highlighted to generate interest amongst children. Important applications of Chemistry in the area of health and hygiene, food, building materials and environment should be discussed to help children understand how Chemistry applies to various aspects of day to day life. Some activities to show different chemical changes or phenomena could be performed by children so that they can develop scientific skills such as, observation, measurement, analysis, interpretation, drawing conclusions, etc.

In the present scenario of the world, where technology has boosted our performance and our understanding of the world affairs, many are focussing their thoughts to the environmental issues. Chemists all around the world are looking into solutions for proper waste disposal, biodegradable products, fuel efficiency. Children too must be sensitised towards environmental concerns. Use of chemicals in the form of pesticides, insecticides, fertilisers and their effect on the environment must be highlighted in class.



The Core concepts of Chemistry for Classes VI – VIII are as follows:

Class VI

Introduction to Chemistry

Elements, Compounds and Mixtures

Matter

Water

Air and Atmosphere

Class VII

Matter and its Composition

Physical and Chemical Changes

Elements, Compounds and Mixtures (experimental-techniques)

Atomic Structure

Language of Chemistry

Metals and Non-Metals

Air and Atmosphere

Class VIII

Matter

Physical and Chemical Changes

Elements, Compounds and Mixtures

Atomic Structure

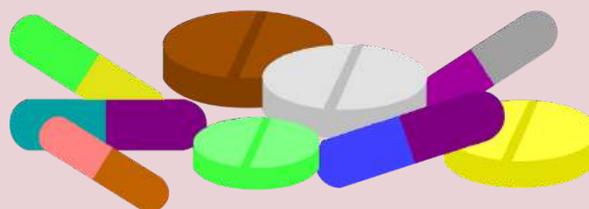
Language of Chemistry

Chemical Reactions

Hydrogen

Water

Carbon and its Compounds



Theme 1: Matter

In earlier classes, Matter was introduced and discussed as composed of atoms/molecules and that it is found in the forms of solids, liquids and gases. In this class the aim of the theme is to enable children to understand that these states are compared on the basis of inter particle state and inter particle collision. The Kinetic theory of matter will be introduced to explain the change of state. They will understand that in a physical and chemical change, the total mass before and after the change remains the same which is known as the law of conservation of mass. Explanation of this theory and law would help them in understanding other behaviour of matter.

Learning Outcomes:

Children will be able to:

- ☑ describe the main postulates of the kinetic theory of matter;
- ☑ explain the reason of change of one state of the matter to another and vice-versa on the basis of inter particle space and inter particle attraction and collision;
- ☑ define and explain the law of conservation of mass using an example.

Matter		
Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<ul style="list-style-type: none"> ▶ Main postulates of kinetic molecular theory of matter. ▶ Explanation of change of state of the matter on the basis of inter particle space and inter particle attraction and collision. ▶ Law of conservation of mass. (statement and explanation with examples). 	<ul style="list-style-type: none"> ▶ Describing and discussing the main postulates of kinetic theory of matter. ▶ Discussing inter particle space and inter particle attraction and collision. (Inter particle space and inter particle attraction varies from one state of matter to another. Hence the conditions of change of state of a matter are different from the other.) ▶ Stating the law of conservation of mass. Activity to show that there is no change in total mass when a physical and chemical change takes place. (If the reaction involves combustion in presence of air, the mass of O₂/N₂ is also to be considered) Total mass of reactants including the mass of atmospheric gases if any, will be equal to the mass of the products formed. ▶ Taking the example of reaction of barium chloride with sodium sulphate. 	<ul style="list-style-type: none"> ▶ Film on the collision of particles and the exchange of energy. ▶ Chemicals and glass wares, barium chloride, sodium sulphate, weighing balance, test tubes, distilled water, filter paper, funnel and beaker.

Integration: Physics

Theme 2: Physical and Chemical Changes

This theme will enable children to understand that there are different types of changes in our surroundings which are slow/fast, reversible/irreversible, periodic/non-periodic and physical/chemical. In physical changes, no new substance is formed while in chemical change, a new substance with properties different from the element forming that substance is formed. Learning of these changes will also help in developing different scientific skills amongst them.

Learning Outcomes:

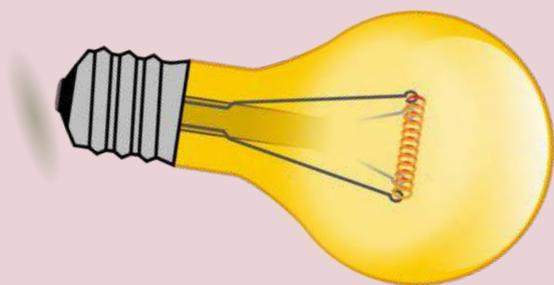
Children will be able to:

- ☑ illustrate different changes occurring in nature with examples learned in previous classes;
- ☑ perform some activities to show some well-known changes;
- ☑ differentiate between physical and chemical changes and classify the changes.

Physical and Chemical Changes

Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Revise and review the topic on Physical and Chemical Changes taught in earlier classes. ➤ Physical and Chemical changes – Classification with examples. 	<ul style="list-style-type: none"> ➤ Providing opportunities to children to recapitulate their previous knowledge during group discussion. Bridging any gaps in their understanding. ➤ Building on children's previous learning. ➤ Providing a list of changes like- inflated balloon will burst when brought near a lighted bulb. 	<ul style="list-style-type: none"> ➤ List of physical and chemical changes: <ul style="list-style-type: none"> ☛ Formation of curd from milk ☛ Curdling of milk ☛ Rotting of eggs ☛ Rusting of iron ☛ Melting of ice ☛ Formation of vapours ☛ Sublimation of camphor

Integration: Geography, Biology, Languages



Theme 3: Elements, Compounds and Mixtures

In previous classes, children were informed about the classification of matter into - elements, compounds and mixtures. Mixture is an important class of matter as most of the matter in nature is found in the form of mixture. In this class children will be enabled to understand that there are various techniques by which components of mixture can be separated.

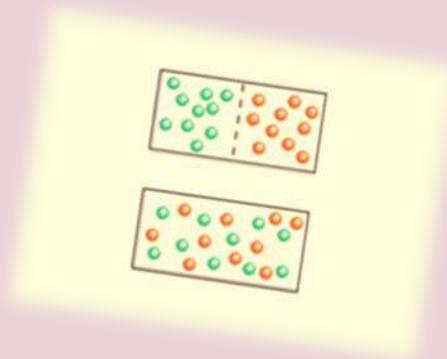
Learning Outcomes:

Children will be able to:

- ☑ recall previous knowledge related to elements, compounds and mixtures;
- ☑ classify substances into elements, compounds and mixtures on the basis of their properties;
- ☑ perform activities to separate components of a mixture;
- ☑ explain the principle involved in using a particular technique in separating a mixture.

Elements, Compounds and Mixtures

Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Revision of Elements, Compounds and Mixtures taught in earlier classes. ➤ Elements, compounds and mixture – a brief explanation. ➤ Separation of the components of a mixture. ➤ Emphasis on the principle of separation. 	<ul style="list-style-type: none"> ➤ Revisiting earlier concepts. ➤ Building on children's previous learning. ➤ Organising the discussion of the topic concerned by question- answer method. ➤ Give feedback to the children about the gaps found in their learning. ➤ Activities performed by children to separate the components of 2-3 mixtures involving different techniques. E.g.- <ul style="list-style-type: none"> ☛ CaCO_3 and NaCl ☛ kerosene and water ➤ Discussing the principle of the techniques involved in separation of different mixtures. 	<ul style="list-style-type: none"> ➤ Collection of samples of some elements, compounds and mixtures.



Theme 4: Atomic Structure

This theme focuses on developing children's understanding about the atom as the building block of all types of matter. Therefore, in science, it becomes important to know about the atom and its structure.

In fact, everything on this earth is made up of atoms. It is the atom of an element that takes part in chemical reactions.

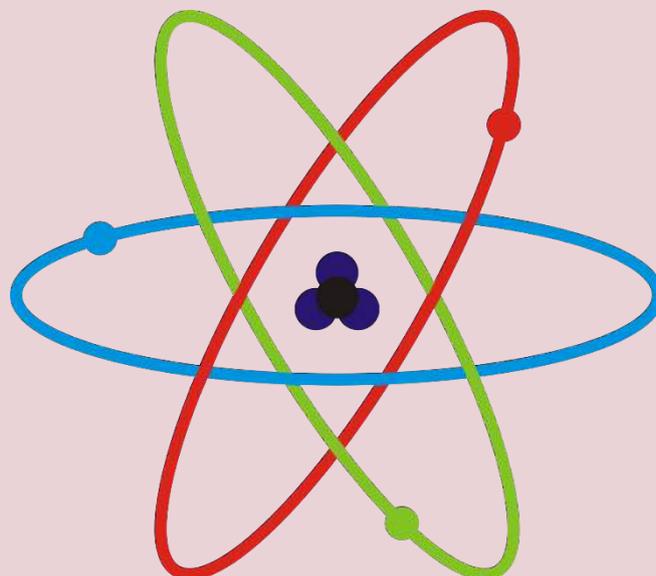
Learning Outcomes:

Children will be able to:

- ✓ describe that an atom consists of electrons, protons and neutrons;
- ✓ define atomic number and mass number;
- ✓ discuss valency of elements and radicals with respect to the number of hydrogen atoms combining with one atom of the element.

Atomic Structure		
Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<ul style="list-style-type: none">▶ Fundamental subatomic particles present in an atom: electrons, protons, neutrons.▶ Nucleus and extra nuclear parts.▶ Atomic number and mass number.	<ul style="list-style-type: none">▶ Discussing historical perspective of discovery of electrons, protons and neutrons.▶ Identifying that a nucleus consists of protons and neutrons. Electrons are present in its extra nuclear part.▶ Describing that atomic number (Z) is the number of protons in an atom. It is also equal to the number of electrons in an atom.▶ Mass number: it is the sum of the number of protons and neutrons in an atom.	<ul style="list-style-type: none">▶ Books of science /Chemistry▶ Charts/Models showing the structure of atom

Integration: Physics.



Theme 5: Language of Chemistry

In previous classes, discussions about the symbols of elements and the formulae of compounds help in expressing their long names as short-hand notations which forms the language of Chemistry. In this class children will develop the ability to derive the Formulae of compounds if symbols of elements/radicals forming the compound and their valencies are known. They will also be able to write chemical equations if the reactants and products and their symbols/ formulae are known to them.

Learning Outcomes:

Children will be able to:

- ☑ recall the symbols of different elements;
- ☑ derive the formulae of compounds on the basis of valencies of elements and radicals;
- ☑ write chemical equation of a reaction;
- ☑ balance chemical equations by applying the law of conservation of mass.

Language of Chemistry		
Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<ul style="list-style-type: none"> ▶ Symbols of elements. ▶ Formulae of compounds. ▶ Chemical equations (from word equations). ▶ Law of conservation of mass. ▶ Balancing simple equations ▶ Relate the law to the balancing of simple equations. ▶ Information gathered from a chemical equation. ▶ Limitations of a chemical equation: Catalyst, conditions for the reaction, state of the reactants and products, nature of the chemical reaction are not gathered from the equation. 	<ul style="list-style-type: none"> ▶ Revisiting earlier concepts. ▶ Building on children's previous learning. ▶ Organising competitions to recapitulate the symbols of elements in the class by using valency cards. (symbols and valency of first twenty elements). ▶ Encouraging children to derive Formulae of compounds from valency and symbols/ formulae of elements/ radicals under the guidance of teacher. ▶ Writing word equations followed by writing the chemical equation. ▶ Explaining the law of conservation of mass and its importance in balancing a chemical equation. ▶ Giving practice in balancing simple equations. ▶ Specifying the state of the reactants and products as (s), (l) and (g) for solid, liquid and gas respectively by writing them after their symbols/ formulae. ▶ Using an equation to discuss with children the information provided and the limitations by/of a chemical equation. 	<ul style="list-style-type: none"> ▶ Valency cards. ▶ Charts depicting the important and simple chemical equations in which the state of reactants and products is also shown.

Integration: Mathematics, Physics

Theme 6: Chemical Reactions

This theme will enable children to understand that several oxides, carbonates and hydrates on heating are converted to other compounds. Oxides of metals and non-metals have basic and acidic character respectively. They will also realize and appreciate that there are different types of reactions such as combinations, decomposition, displacement, double displacement, exothermic and endothermic reactions.

Learning Outcomes:

Children will be able to:

- ☑ describe different types of chemical reactions with examples;
- ☑ identify the type of chemical reaction;
- ☑ identify different oxides as basic, acidic, amphoteric and neutral;
- ☑ explain the effect of heat on oxides of some metals.

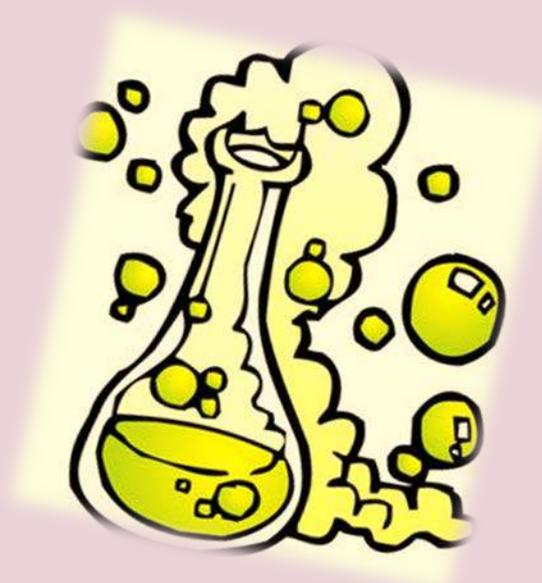
Chemical Reactions

Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<ul style="list-style-type: none"> ▶ Types of reactions: <ul style="list-style-type: none"> ☛ Combination ☛ Decomposition ☛ Displacement ☛ Double displacement. ▶ Reactivity series: <ul style="list-style-type: none"> ☛ In reactivity series metals are arranged in order of their reactivity. ☛ The metal that displaces the metal ion from the solution is more reactive. ▶ Predict the reactivity of metals. 	<ul style="list-style-type: none"> ▶ Explaining that chemical reactions involve breaking of existing bonds and formation of new bonds with absorption or release of energy normally in the form of heat or light. Explaining with examples using chemical equations. ▶ Giving examples of reactions from daily life - burning of fuel. ▶ Showing burning of a magnesium ribbon. ▶ Explaining the different types of reactions with examples and activities: <ul style="list-style-type: none"> ☛ Synthesis $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$ $\text{Ca(OH)}_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$ $\text{C} + \text{O}_2 \rightarrow \text{CO}_2$ ☛ Decomposition Decomposition of CaCO_3, PbO. ☛ Displacement Displacement of Cu from CuSO_4 by Zn. ☛ Double displacement Both the ions are displaced - $\text{NaCl} + \text{AgNO}_3$ ▶ Asking children to arrange metals - Cu, Ag, Al, Mg, Fe in decreasing order of their reactivity by consulting the table of reactivity series. ▶ Conducting experiments for different metals with metal salt solution. ▶ Demonstrating through activity: 	<ul style="list-style-type: none"> ▶ Magnesium wire, match box. ▶ Limestone, tongs, test tube, burner. ▶ CuO, ZnO, Al_2O_3, litmus paper.

Chemical Reactions

Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<p> ▶ Endothermic and exothermic processes/ reactions. ▶ Neutralization reaction. ▶ Decomposition reactions to form Oxides. ▶ Classification of oxides: <ul style="list-style-type: none"> ▶ Acidic ▶ Basic ▶ Amphoteric ▶ Neutral. Metal oxides are basic; non-metal oxides are acidic in nature. Acidic oxides react with base and basic oxides react with acids. some oxides such as ZnO, PbO react both with acids and bases. These are amphoteric oxides. </p>	<p> ▶ neutralization of an acid with a base as an exothermic reaction. ▶ dissolution of NH_4Cl in water is an endothermic process. ▶ Heating metal carbonates, nitrates, sulphates yield oxides and carbon dioxides. Oxides are also formed by heating element in presence of air. <ul style="list-style-type: none"> ▶ Activity-1 Heating limestone strongly over the flame - CaO is formed ▶ Activity-2: Heating Lead carbonate strongly - PbO is formed. ▶ Dissolving the oxide in water and testing the acidic, basic and neutral oxide with litmus paper. </p>	

Life skills: Critical thinking, observation, interpretation, analysis



Theme 7: Hydrogen

This theme focuses on enabling children to know about one gas- Hydrogen and that it is an important constituent of several compounds. It is found in acids and organic compounds. It acts as a fuel which makes its study useful.

Learning Outcomes:

Children will be able to:

- ☑ describe the preparation of hydrogen from electrolysis of water;
- ☑ prepare hydrogen in the lab. using zinc and acid;
- ☑ describe properties and uses of hydrogen;
- ☑ correlate concepts of oxidation and reduction with addition and removal of oxygen or removal and addition of hydrogen.

Hydrogen		
Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Preparation of hydrogen, from water – electrolysis (Introduction to terms electrode, electrolyte, electrolysis - detailed process not required). ➤ Preparation of hydrogen in the laboratory. ➤ Preference of zinc as the metal to be used (with reasons). ➤ Choice of dilute acids (other than dil. nitric acid). ➤ Bosch's process. ➤ Properties and uses of hydrogen. ➤ Oxidation and Reduction. 	<ul style="list-style-type: none"> ➤ Preparing hydrogen by the electrolysis of acidified water. ➤ Demonstrating activity to prepare hydrogen by the reaction of Zinc with acid. (It is collected by the downward displacement of water as it is lighter than air) ➤ Discussing properties and uses of hydrogen. ➤ Correlating the concept of oxidation and reduction with addition and removal of oxygen or removal and addition of hydrogen. ➤ Explaining the concept by using the example of one student gaining oxygen and the other losing oxygen, thereby getting oxidised and reduced respectively. 	<ul style="list-style-type: none"> ➤ Experimental assembly set up in the lab. ➤ Charts on preparation of Hydrogen.

Integration: Physics

Theme 8: Water

Water is the one of the most important resources and is a universal solvent. Children will know and understand that water is important for all living beings (animals, human beings, plants and trees), comes from different sources and has many uses. There are different sources of water such as sea, well, river, lake, pond, rain. We use it daily for washing, bathing, drinking and in industries. Water helps in controlling the temperature of the atmosphere.

Learning Outcomes:

Children will be able to:

- ☑ describe that water dissolves many substances and it is a universal solvent;
- ☑ identify a solution, suspension and colloid on the basis of properties;
- ☑ state the differences between saturated, unsaturated and supersaturated solutions;
- ☑ describe water of crystallization;
- ☑ write equations of metals with cold water and steam;
- ☑ describe hard and soft water;
- ☑ discuss the different methods of softening of water.

Water

Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Dissolution of salts in water – meaning and explanation. ➤ Universal solvent – meaning. ➤ Solutions, suspensions, colloids. ➤ Differentiate unsaturated/saturated and supersaturated solutions. ➤ Suspensions and colloids. ➤ Water of crystallisation. ➤ Hydrated and Anhydrous substances, hygroscopic. ➤ Reactivity of metals with cold water, hot water and steam (with products formed). ➤ Hard and soft water and methods of softening of hard water. ➤ Disadvantage of using hard water. ➤ Removing hardness of water by boiling or by treating with washing soda. 	<ul style="list-style-type: none"> ➤ Revisiting earlier concepts. ➤ Building on children's previous learning. ➤ Recognising dissolving capacity of water by conducting experiments on dissolving a number of salts in water. ➤ Differentiating between suspension and colloid on the basis of the size of solute particles. ➤ Asking children to collect samples of colloids and suspensions under guidance and supervision. ➤ Differentiating between saturated, unsaturated and supersaturated solutions on the basis of the quantity of the solute dissolved. ➤ Showing children that by heating blue crystals of hydrated copper sulphate, when it turns white due to the loss of water of crystallisation. ➤ Showing reaction of metals (e.g. iron, calcium) with cold water and steam. ➤ Taking example of CaCl₂ for absorbing water from salts. ➤ Discussing the presence of silica gel in bottles to absorb moisture. ➤ Determining the reactivity of Na, Mg, MgO, CaO etc. with water to show different chemical reactivity. ➤ Differentiating between the ability to form lather by hard and soft water to be shown by an activity. 	<ul style="list-style-type: none"> ➤ NaCl, KCl, Na₂CO₃ etc. Sugar, water, broken glass rod, burner. ➤ Collection of samples of solutions, suspensions, colloids. ➤ Copper sulphate crystals. ➤ Soap solution, clay in water ➤ CaCl₂. ➤ Silica gel pouch in water bottles. ➤ Sodium metal, magnesium ribbon, MgO, CaO. ➤ Washing soda.

Theme 9: Carbon and its Compounds

In this theme children will learn the importance of carbon and some of its compounds. It is a constituent of all plants and animals. In fact, a large number of compounds are made up of carbon. It is a very versatile element.

Products such as paper, wooden furniture, soaps, food items are made up of carbon as one of their elements and used extensively in daily life activities. The fuel that is used in cars and trucks is also made of carbon.

Learning Outcomes:

Children will be able to:

- explain the term allotropy;
- describe different Allotropes of Carbon;
- state the properties of Graphite and Diamond;
- prepare carbon dioxide in a laboratory;
- describe the uses of carbon dioxide;
- demonstrate different reactions of carbon dioxide with lime water and litmus solutions.

Carbon and its Compounds

Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<ul style="list-style-type: none"> ▶ Allotropes of Carbon - definition and explanation. ▶ Crystalline and amorphous nature of allotropes of carbon. ▶ Uses of diamond, graphite, coke, coal, soot. ▶ Laboratory preparation, properties and uses of carbon dioxide ▶ Physical properties of Carbon dioxide. ▶ Chemical properties of 	<ul style="list-style-type: none"> ▶ Defining allotropes and explaining it with different examples, -diamond, graphite, coal, etc. ▶ Emphasising on different physical properties but same chemical properties of allotropes. ▶ Explaining that the properties such as electric and thermal conductivity of the two allotropes are different. ▶ Emphasising that the difference in physical properties is due to their different structures. Showing the models of structures and discussing the differences. ▶ Making models using clay dough / other molecular models. ▶ Discussing the classification of crystalline and amorphous nature of carbon. ▶ Defining Allotropes on the basis of their Crystalline and amorphous nature. ▶ Making a list of the uses of diamond, graphite, coke, coal, soot from the literature and internet. ▶ Demonstrating the preparation of CO₂ from marble/ Na₂CO₃ and dil. HCl and showing its collection by upward 	<ul style="list-style-type: none"> ▶ Models of structures of Diamond and Graphite. ▶ Sample of Graphite as an electrode. ▶ Woulff bottle/ R.B. flask, delivery tube, thistle funnel, jar. Dil. HCl, marble pieces/ Na₂CO₃

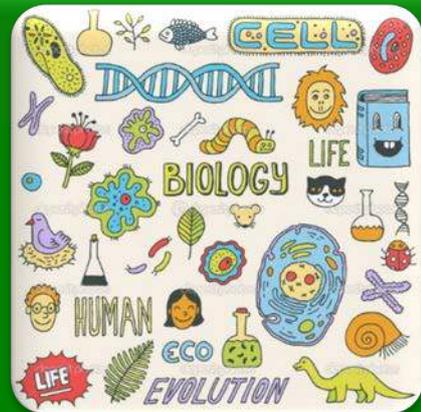
Carbon and its Compounds

Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<p>Carbon Dioxide.</p> <ul style="list-style-type: none"> ➤ Acidic nature. ➤ Reaction with lime water. ➤ Properties and uses of Carbon monoxide. ➤ Emphasis on use as reducing agent in the extraction of iron. ➤ Emphasize the harmful properties of Carbon monoxide when inhaled - Asphyxia. 	<p>displacement of air.</p> <ul style="list-style-type: none"> ➤ Showing physical properties of CO₂ with its sample along with its fire extinguishing properties. ➤ CO₂ shows many important chemical reactions such as: <ul style="list-style-type: none"> ➤ It reacting with basic oxides such as Na₂O, MgO to form metal carbonates. ➤ Action on lime water: - showing that it turns lime water milky and on passing excess CO₂, the milkiness disappears. ➤ Explaining Fuel, if not burnt in a good supply of oxygen may lead to the formation of CO. <i>(traditional cooking methods in villages using cow dung or wood).</i> ➤ Using it in industries as a reducing agent- in metallurgy of iron. ➤ Explaining why we should not stand behind a running engine of a vehicle. ➤ Discussing Government's efforts to spread the use of LPG even to remote areas of the country. 	

Integration: Geography, Biology



Biology

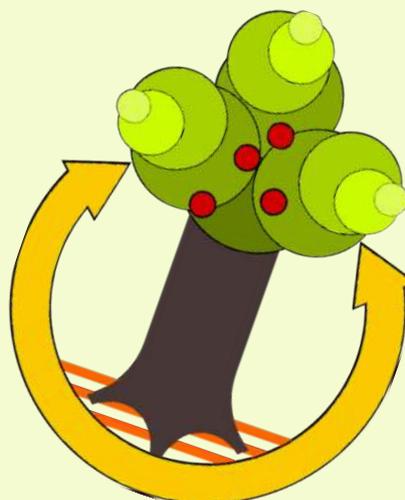


Biology is perhaps the most fascinating of all the sciences, as it is the science of life, and is aptly called life science. More than anything else, Biology is a quest, an ongoing inquiry about the nature of life.

Scientists all over the world are engaged in solving biological puzzles that once seemed unsolvable. We are moving closer to our understanding of many things such as how a single microscopic cell develops into a complex plant or animal; how plants convert solar energy into the chemical energy of food; how the human mind works; how various forms of life network in biological communities such as forests and coral reefs; how the great diversity of life on Earth evolved from the first microbes, etc.

The discovery of the double-helical structure of the DNA, deciphering of the genetic code, and three-dimensional structure of many macromolecules led to the phenomenal growth in the field of Molecular Biology. Recent breakthroughs in genetics and molecular cell biology are transforming medicine and agriculture. New models in ecology are helping scientists to evaluate environmental issues such as increasing atmospheric levels of carbon dioxide leading to global warming and the destruction of the ozone layer.

Biology also plays a valuable part in general education and its day to day relevance in the lives of children, in terms of nutrition, health and hygiene, medicines and a host of other useful products needs to be highlighted. At the same time, the curiosity of children towards environmental issues needs to be aroused and knowledge be imparted through the study of nature and the consequences of upsetting nature be addressed.



The core concepts of Biology for Classes VI – VIII are as follows:

Class VI

Plant Life
The Cell
Human Body
Health and Hygiene
Adaptation

Class VII

Tissue
Kingdom Classification
Plant Life
Human Body
Health and Hygiene

Class VIII

Transport of Food and Minerals in Plants
Reproduction in Plant and Animals
Ecosystems
Human Body-Endocrine, Circulatory and Nervous Systems
Health and Hygiene
Food Production



Theme 1: Transport of Food and Minerals in Plants

This theme deals with the movement of water containing minerals and food with plants. The exchange of water, gases, minerals and other substances into and out of the cells and also between neighbouring cells, takes place through a system called transportation system. In unicellular organisms (*Chlamydomonas*) and simple multicellular organisms like *Spirogyra*, diffusion is a major method of transportation. Diffusion of water across a semipermeable membrane is called osmosis. In complex higher plants because of enormity of size and complex organization, there is an elaborate transportation system and transport occurs through a vascular system of independent channels or conducting tubes (xylem and phloem). In addition to transport, xylem tissue also provides mechanical strength to the plant body. Essential mineral nutrients are also needed for the healthy growth of plant. In the absence or non-availability of the essential element the plant shows specific deficiency symptoms.

Learning Outcomes:

Children will be able to:

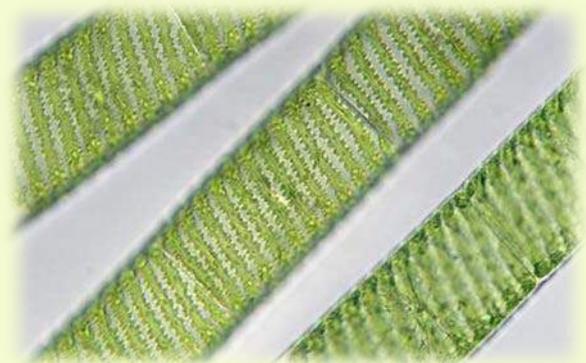
- ✓ learn about the existence of a transport system inside the plant body of complex multicellular higher plants;
- ✓ explain that transport in unicellular and simple multicellular plants takes place by diffusion;
- ✓ define and discuss diffusion, osmosis, transpiration, root pressure;
- ✓ perform experiments and demonstrate the process of osmosis;
- ✓ realize that the minerals required are either micronutrients or macronutrients depending upon the quantity required by the plants;
- ✓ relate that the deficiency or lack of essential nutrients leads to specific symptoms and diseases.
- ✓ define transpiration, interpret its role in xylem transport and know about the factors affecting rate of transpiration.
- ✓ demonstrate transpiration through simple experiments.

Transport of Food and Minerals in Plants

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p>Transport in Plants</p> <ul style="list-style-type: none"> ▷ Diffusion – definition; ▷ Osmosis – definition, example, semipermeable membrane, root pressure; active transport. ▷ Transpiration - definition, importance and factors affecting transpiration. ▷ Structure and function of Xylem and Phloem in detail; ▷ Importance of minerals: macro and micro- 	<ul style="list-style-type: none"> ▷ Asking children to find out the presence/absence of conducting tissues in simple plants like <i>Chlamydomonas</i>, <i>Spirogyra</i> and higher plants like <i>Petunia</i>, <i>Vinca</i>, mustard, balsam, mango tree and neem tree; ▷ Experiments <ul style="list-style-type: none"> • Putting a twig of (with white flowers) of petunia, balsam or <i>Vinca</i> in coloured water and noting the flower and portion of stem that becomes coloured (in a 	<ul style="list-style-type: none"> ▷ Charts, models ▷ PPTs, Videos ▷ Laboratory experiments ▷ Discussion ▷ Drawings

Transport of Food and Minerals in Plants

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p>nutrients; three deficiency diseases caused by lack of these essential nutrients.</p>	<p>transverse/ vertical section of the twig).</p> <ul style="list-style-type: none"> ☛ Demonstrating experiments on osmosis (potato osmoscope), diffusion, root pressure and transpiration (covering the aerial part with a bell jar/transparent colourless bag). ☛ Performing simple experiments to study the process of diffusion, osmosis, active transport and transpiration. ➤ Transverse section of wood of neem/mango or any other locally available specimen. ➤ Providing opportunities for observation of the conducting tissues through permanent/ freshly prepared slides, charts, models and PPTs; ➤ Asking children to draw the outline of transverse and vertical sections of stem of some of the above mentioned plants and locate the presence of xylem and phloem under the microscope; ➤ Drawing and labelling diagrams of experiments on osmosis, diffusion. 	



Theme 2: Reproduction in Plants and Animals

Reproduction is one of the most important functions of living organisms. It is essential for perpetuation of species. There are two ways by which living organisms give rise to new organisms - Asexual (vegetative propagation) and sexual reproduction. While asexual reproduction involves a single individual parent, sexual reproduction involves two different individuals of different sexes, one male and another female. In this theme children will learn more about various methods of vegetative/asexual reproduction in plants and animals, a brief account of fertilization and post fertilization changes in flower and main organs of reproductive system of human male and female.

Learning Outcomes:

Children will be able to:

- ☑ record during a visit to garden the common names of plants and how they are multiplied;
- ☑ observe and correlate butterflies and honeybees moving around flowers to the process of pollination;
- ☑ ask the gardener how he raises or multiplies plants like jasmine, rose, Bryophyllum, Chrysanthemum, Dahlia, potato and money plant;
- ☑ observe in a nursery how cuttings and budding methods of vegetative propagation are used for growing larger number of roses;
- ☑ observe how grass plants which are planted at some distance from each other cover the entire soil after some days due to vegetative propagation;
- ☑ recognize that sexual reproduction involves the fertilization of an egg cell by a sperm cell to produce offspring that may closely resemble the parents.

Reproduction in Plants and Animals

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p style="text-align: center; background-color: red; color: white; margin: 0;">PLANTS</p> <p>➤ Types of Asexual reproduction: Binary fission, budding, fragmentation, spore formation, vegetative propagation, artificial propagation by tissue culture (basic process along with a suitable example of each)</p> <p>➤ Sexual reproduction in Plants:</p> <ul style="list-style-type: none"> ☛ Review of parts of a typical flower (4 whorls and their structure and function) ☛ Pollination: self and cross; ☛ Agents of pollination: three characteristics of plants pollinated by insects, water and wind (with examples). 	<ul style="list-style-type: none"> ➤ Asking children their experiences about multiplication and reproduction in plants and animals seen by them in their surroundings. ➤ Analysing the advantages and disadvantages of vegetative propagation in group work. ➤ Learning the economic importance of artificial propagation. ➤ Providing opportunities for observations through various ways – <ul style="list-style-type: none"> ☛ <i>Observations of actual specimens in the field, dissecting a bisexual flower (mustard, china rose, vinca) to study the</i> 	<ul style="list-style-type: none"> ➤ Actual specimens of flowers ➤ Biology laboratory with a dissecting and a compound microscope. ➤ Dissection of typical bisexual flower to study the different whorls. ➤ PPTs and Videos. ➤ Permanent/temporary slide preparations of budding in yeast and Hydra, dividing bacterium, fragmentation (fungal hypha/any filamentous algae, conidiophores or any other vegetative spores of any fungus. ➤ Bagging technique (emasculation and artificial pollination) ➤ Tissue culture photographs

Reproduction in Plants and Animals

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p>Characteristics of flowers of each kind.</p> <ul style="list-style-type: none"> ☛ Fertilization process in brief by flow chart. ☛ Mention of artificial pollination. 	<p><i>different whorls;</i></p> <ul style="list-style-type: none"> ☛ <i>Observing permanent slides in the laboratory;</i> ☛ <i>Observing the pollinators (butterflies/ bees) and their movement from one flower to another of same plant, or from a flower of one plant to flower of another plant, observing a flower changing into a fruit in a kitchen garden (tomato/chilli/lady's finger etc.) and discussing pollination process in them.</i> 	
<p style="text-align: center;">ANIMALS</p> <ul style="list-style-type: none"> ➤ Sexual reproduction in humans: ➤ Main organs of male and female reproductive system 	<ul style="list-style-type: none"> ➤ Observing the flower of wheat, rice and maize plants; ➤ Learning through charts, PPTs, videos, the process of fertilization and artificial pollination. ➤ Explaining the main organs of human reproductive system (male and female) through charts and models. 	<ul style="list-style-type: none"> ➤ Charts/models/PPTs/videos of human reproductive system (male and female)

Theme 3: Ecosystems

A community of organisms (plants and animals) in a given area, live in harmony with the environment. There is a close interaction between the living (called biotic) and non-living (called abiotic) components of the environment. The study of interaction between biotic and abiotic components is known as ecology and the ecosystem is the basic unit of study. There are many types of ecosystems, namely aquatic (fresh water/ marine), terrestrial (forest/ grassland/ desert), etc. The composition of biotic community and the abiotic components (environment) varies in different ecosystems. Organisms develop adaptations suited to live in a particular environment. Living organisms, which may be producers (plants), consumers (animals) or decomposers (micro-organisms), are linked to each other through food chains. Ecosystems exhibit two important functional attributes (a) A unidirectional flow of energy from sun to producers to consumers and finally to decomposers, and (b) Cyclic flow of nutrients.

Learning Outcomes:

Children will be able to:

- ✔ define the terms ecosystem, producer, consumer, decomposer, food chain, food web and pyramid of numbers, with examples (technical terms);
- ✔ explain and analyze the biotic and abiotic components of an ecosystem;
- ✔ interpret the relationship between different biotic components in terms of food chain, food web and pyramid of numbers;
- ✔ evaluate the abiotic factors and their influence on biotic factors;
- ✔ describe and provide examples for inter dependence relationships between organisms (symbiosis, parasitism and predation);
- ✔ draw relationship between the flora and fauna of a particular forest ecosystem;
- ✔ make a flow chart of a food chain and food web.

Ecosystems		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ▷ Understanding ecosystems: definition, interaction between biotic and abiotic factors; ▷ Biotic components consisting of producers, consumers, decomposers. Meaning of food chain. Food web, and pyramid of numbers. ▷ Interdependence between organisms: symbiosis, parasitism and predation. ▷ Brief account of abiotic or non-living components such as air, soil, water and climatic factors such as sunlight, temperature, humidity and wind; ▷ Only, forest ecosystem with its flora and fauna to be taught. 	<ul style="list-style-type: none"> ▷ Asking children to observe plants and animals in their surroundings and noting down: <ul style="list-style-type: none"> ☛ <i>their names (help of the class teacher may be sought);</i> ☛ <i>names of animals which consume plants.</i> ☛ <i>names of larger animals which eat smaller ones.</i> ☛ <i>names of omnivores (if any)</i> Using the data collected to construct food chain, food web. ▷ Providing opportunities for observations on the flora and fauna of a forest ecosystem, and noting down: <ul style="list-style-type: none"> ☛ <i>The different producers and consumers;</i> ☛ <i>the decomposers acting on the leaves fallen on the forest floor, and</i> ☛ <i>the abiotic factors.</i> 	<ul style="list-style-type: none"> ▷ Visit to school/local garden, forest area ▷ Charts, photographs, PPTs. ▷ Specimens/pictures /charts of examples for predation, symbiosis, parasitism

Integration: Geography, Languages

Life Skill: Concern for environment

Theme 4: Human Body – Endocrine, Circulatory and Nervous Systems

This theme focuses on the nervous system. It aims at enabling children to know and understand that in human beings, there are two kinds of control and coordination (nervous and chemical). The nervous coordination is brought about by the nervous system, and the chemical coordination by the chemicals called hormones. Children will also learn about the hormonal system called endocrine system. In addition, this theme will build and expand on the respiratory, circulatory and systems, which were introduced in earlier classes.

Learning Outcomes:

Children will be able to:

- ☑ explain that in addition to nervous control, another control/coordination mechanism called hormonal control also exists in humans;
- ☑ define the terms – endocrine system, hormones, endocrine and exocrine glands;
- ☑ draw a diagram showing the location of endocrine glands in the body and describe the functions of hormonal glands namely the thyroid, adrenal, pituitary and pancreas;
- ☑ relate the knowledge gained and explain the changes in their own bodies;
- ☑ become aware about the changes that occur during adolescence and how to manage the emotional and physical changes;
- ☑ explain the techniques used in the management of stress;
- ☑ draw diagrams of the heart, circulatory system, neuron and reflex action;
- ☑ list out the functions of the heart, nervous system, lymph, RBC and WBC.

Human Body – Endocrine, Circulatory and Nervous Systems

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p style="text-align: center;">Endocrine System</p> <ul style="list-style-type: none"> ➤ Two types of glands- exocrine, endocrine (basic concept and difference); ➤ Hormone (definition). ➤ Hormonal glands - (thyroid, adrenal, pancreas, pituitary); location and function of each. ➤ Following points to be studied in tabular form: name of gland, location in body, secretion, function. 	<ul style="list-style-type: none"> ➤ Discussing and explaining to children, the concept of hormones and endocrine glands. ➤ Describing the endocrine system in human beings through chart, models, PPTs and videos. ➤ Asking children to show the location of endocrine glands in the human body by means of a labelled diagram. ➤ Talk by the school physician emphasizing the role of endocrine glands in the life of the children; changes during adolescence and management of stress. 	<ul style="list-style-type: none"> ➤ Charts and models. ➤ PPTs and videos. ➤ School Physician/Doctor. ➤ Photographs of the structure of heart, neuron, circulatory system, nervous system. ➤ B.P measuring instrument, ECG; ➤ Charts and videos on reflex action.
<p style="text-align: center;">Adolescence and accompanying changes</p> <ul style="list-style-type: none"> ➤ Physical and emotional changes in the body during adolescence. ➤ Importance of personal hygiene. 	<ul style="list-style-type: none"> ➤ Discussing how hormones bring about changes in the body. ➤ Explaining the changes taking place (physical and emotional) in the body during adolescence; ➤ Discussing the importance of personal hygiene; 	

Human Body – Endocrine, Circulatory and Nervous Systems

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p>➤ Stress management (meaning of stress; ways to tackle stress: yoga, meditation, time management, sports, hobbies, rational thinking etc.)</p> <p style="text-align: center;">Circulatory System</p> <p>Revisit learning of earlier class</p> <p>➤ Internal structure of heart in detail (including valves, septum; pace maker).</p> <p>➤ Schematic diagram of the heart;</p> <p>➤ Blood vessels - aorta, pulmonary trunk, coronary artery & vein, vena cava.</p> <p>➤ Circulation of blood as double circulation.</p> <p>➤ Blood Groups (A, B, AB and O): universal donor and universal acceptor.</p> <p>➤ Conditions related to the functioning of the heart: palpitations, cardiac arrest and hyper tension.</p> <p>➤ Introduction of lymphatic system as a parallel circulatory system.</p> <p style="text-align: center;">Nervous System</p> <p>Revisit learning of earlier class</p> <p>➤ Types of nerves: sensory, motor, mixed (function only). Cranial and spinal nerves (only definition and number).</p> <p>➤ Structure of a motor neuron</p> <p>➤ Central nervous system (CNS) in detail with its parts and their functions.</p> <p>➤ Reflex action: definition and basic terms used to describe reflex action stimulus, response, impulse, receptor, effector); common examples of reflex action.</p>	<p>➤ Discussing various ways to tackle stress.</p> <p>➤ Revisiting previous concepts learnt by children.</p> <p>➤ Revising what has been discussed in previous class.</p> <p>➤ Building on children's previous learning.</p> <p>➤ Explaining the internal structure of heart in detail including information on valves, septum and pace maker.</p> <p>➤ Encouraging children to draw a labelled diagram of the heart.</p> <p>➤ Discussing about the different types of blood vessels and double circulation.</p> <p>➤ Introducing the lymphatic system and its role.</p> <p>➤ Revising what has been discussed in previous class.</p> <p>➤ Learning about the structure of a neuron.</p> <p>➤ Explaining the central nervous system in detail through charts and diagrams.</p> <p>➤ Discussing with children about Reflex action and its impact in their daily lives. Citing the example of Pavlov's experiment on the dog, and its relation to our body.</p> <p>➤ Providing experiences to children by making them experience common reflex actions – when a hand is moved in front of the face – eyes close; when a knee is tapped while sitting, the foot moves forward etc.</p>	

Theme 5: Health and Hygiene

In the previous classes, children learnt about health, personal and public hygiene, balanced diet, deficiency diseases, life style associated health problems and diseases caused by infection. In this class this theme aims at enabling children to know more about communicable diseases and understand their mode of transmission and prevention. Further, they will also understand the role of the immune system of the body in resisting diseases and the concepts of vaccination and immunization. Children will also appreciate the importance of 'First Aid' and learn to undertake some simple common first aid measures to deal with emergency situations.

Learning Outcomes:

Children will be able to:

- ☑ identify some communicable diseases, their causative agents and symptoms;
- ☑ show concern towards maintaining personal hygiene and cleanliness of the surroundings;
- ☑ list some common vector borne diseases;
- ☑ differentiate between vaccination and immunization;
- ☑ list the harmful effects of consumption of tobacco, drinking alcohol and taking habit forming drugs;
- ☑ use some simple first aid methods in day to day emergency situations.

Health and Hygiene

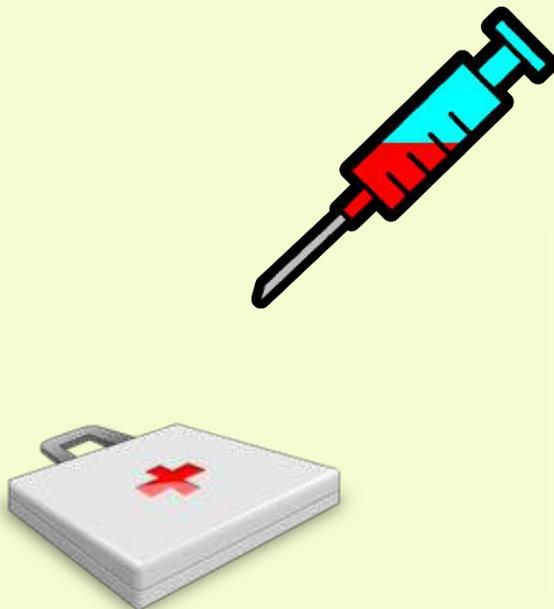
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p style="text-align: center; background-color: red; color: white; margin: 0;">Diseases</p> <ul style="list-style-type: none"> ▷ A brief idea of communicable diseases (influenza, measles, malaria, dengue, chikungunya, HIV) – causative agents, symptoms and prevention to be dealt with in a tabular form. ▷ The meaning of vector. ▷ Method of preventing diseases in general; use of vaccines to be mentioned. ▷ Vaccination and immunization: the concepts and difference between the two. ▷ Harmful effects of consuming tobacco, drinking alcohol, taking drugs. 	<ul style="list-style-type: none"> ▷ Revising the topic on diseases, done in class VI. ▷ Revisiting concepts learnt by children. ▷ Building on children's previous learning. ▷ Explaining briefly about communicable diseases, their causal organisms, symptoms produced and methods of prevention and control. ▷ Discussing the general methods of preventing diseases. ▷ Explaining the concept of vaccination and immunization, giving examples. ▷ Discussing the harmful effects of consuming tobacco, drinking alcohol and taking drugs. 	<ul style="list-style-type: none"> ▷ PPTs, videos, documentaries on communicable diseases, first aid, harmful effects of liquor, drugs and tobacco. ▷ First aid Box. ▷ Visit to a hospital/ consulting the school physician. ▷ Hospital. ▷ School Physician/Doctor. ▷ Specimens/pictures of tobacco products showing warning messages. ▷ Charts/ PPTs/ of diseases such as malaria, chikungunya, measles, etc. ▷ Medicine shop, school dispensary.
<p style="text-align: center; background-color: red; color: white; margin: 0;">First Aid</p> <ul style="list-style-type: none"> ▷ First aid- meaning. ▷ First aid given in the following cases: (burns, bleeding, fracture, 	<ul style="list-style-type: none"> ▷ Requesting the school physician to demonstrate the methods of giving first aid. 	

Health and Hygiene

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
object in the eye, unconsciousness, swallowing poison, snake bite, stings).	<ul style="list-style-type: none">➤ Organising a visit to the nearby hospital asking children to observe and then conduct a discussion with them.➤ Asking children to prepare a first aid box which they can use at home.	

Integration: Health and Physical Education, Languages

Life Skills: Health Awareness, taking care of oneself and others



Theme 6: Food Production

Plants and animals provide a number of useful products to mankind. Plants are useful to us in many ways - as sources of food, fibre, timber, medicines, oils, dyes, resins and as ornamentals. Likewise, animals provide us milk, flesh, eggs, fibre, honey, silk, lac, and many more items. Micro-organisms like bacteria are also useful to us - in the production of cheese, bread, alcohol, vinegar and vaccines. There has been a great improvement in the techniques of food production and their scientific management over the years. This theme introduces children to the various methods of food production.

Learning Outcomes:

Children will be able to:

- ☑ discuss uses of bacteria in the food industry;
- ☑ list importance of mushroom and yeast in the food industry;
- ☑ explain the meaning of agriculture, horticulture, pisciculture (fish farming), apiculture, sericulture, green revolution, white revolution and animal husbandry;
- ☑ identify and provide examples for various food crops and cash crops cultivated in India and make a list of useful cereal, fruit and vegetable plants;
- ☑ list common names of (i) useful plants and animals, (ii) ornamental plants/decorative flowers;
- ☑ list the milk-yielding (milch) animals, meat and egg-laying animals, draught animals and poultry.

Food Production		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Bacteria: uses of bacteria in food industry. ➤ Fungi - Importance of mushrooms and yeast in food industry. ➤ Agriculture: cultivated crops (food-crops and cash crops), crops grown in India. ➤ Horticulture- vegetables, fruits, decorative plants and flowers. ➤ Organic farming and green revolution in brief (awareness level). ➤ Animal husbandry: milk yielding (milch) animals; white revolution; meat providing livestock; draught animals (heavy work); poultry; fish farming (pisciculture); sericulture and apiculture (awareness level). 	<ul style="list-style-type: none"> ➤ Giving opportunities to children to: <ul style="list-style-type: none"> ☛ <i>observe the use of bacteria in making curd and cheese</i> ☛ <i>observe specimens of mushroom, and note down the useful parts;</i> ☛ <i>draw pictures of the plants along with the useful parts;</i> ➤ <i>Organizing visits to:</i> <ul style="list-style-type: none"> ☛ <i>a garden to observe the decorative plants and listing the plants observed;</i> ☛ <i>farms for studying the milk- yielding, meat-yielding and poultry animals;</i> ☛ food industries ☛ sericulture and a pisciculture centre ☛ Collecting photographs of above listed categories of animals. ➤ Growing plants organically within the school premises and comparing these plants with plants grown otherwise. ➤ Showing a film on the green and white revolution in India followed by a discussion/class debate about the about the same. 	<ul style="list-style-type: none"> ➤ Field Visits ➤ PPTs and videos. ➤ Visit to food industries ➤ Visit to sericulture and a pisciculture centre ➤ Pictures of ornamental plants. ➤ Decorative flowers. ➤ Film on Green revolution/ white revolution.

Integration: Geography

*COMPUTER
STUDIES*

Computer Studies



Introduction

With computers, mobiles and tablets present in most urban households, children today have far greater access to these devices than ever earlier. With their natural tendency to explore, they are often adept at learning by themselves or by observation. It is important to identify the content suitable for the children according to their age and introduce it to them at the opportune time. Keeping in mind their curiosity and knowledge, this curriculum provides children with opportunities to use modern technology to enhance their learning in all subjects. It also generates awareness among them about risks like long hours of usage to play or inappropriate access to the internet. This curriculum also ensures that children become digitally literate, i.e. able to use, and express themselves and develop their ideas through ICT at level suitable for the future workplace and as active participant in the digital world.

Aim

This curriculum helps the learner:

- to become competent, confident, responsible and critical user of technology.
- to develop the appropriate social skills that are essential for co-operative and collaborative learning.
- to take ownership of their own learning.
- acquire knowledge and skills in using Information and Communications Technology (ICT) to accomplish tasks, communicate, and facilitate activities.
- develop awareness regarding the developments and emerging issues concerning computing and society;
- develop critical and analytical thinking skills for practical solutions.
- develop creative skills for problem solving.

The Core Concepts of Computer Studies for Classes VI-VIII are as follows:

Class VI

Categories of Computer and Computer Languages

File Management – Organisation of Data

Word Processor – Tabular Presentation

Word Processor – Mail Merge

Presentation – Visual Effects

Scratch Programming – Introduction to Game Creation

HTML – An Introduction

Internet – Online Surfing

Class VII

Computer – Hardware Components

Number System – An Introduction

Computer Virus

Ethics and Safety Measures in Computing

Spreadsheets – An Introduction

Database and DBMS – An Introduction

HTML – Advanced Features

Class VIII

Operating System and Graphic User Interface – Role and Functions

Spreadsheet – Functions and Charts

Algorithms and Flowcharts

Program Coding

App Development

Networks

Topic 1: Operating System (OS) and Graphical User Interface (GUI) – Role and functions

This topic will familiarize and develop children's understanding about the operating system as an integral and important program of a computer system. It can be Character User Interface (CUI, e.g. DOS) or Graphical User Interface, GUI (e.g. Windows). They will know about some of the functions of OS: to boot the computer, perform basic computer tasks like managing peripheral devices (mouse, keyboard, printer, etc.), handling system resources, like computer's memory, sharing CPU, etc.

Learning outcomes:

Children will be able to:

- ☑ differentiate between CUI and GUI in terms of multitasking;
- ☑ list the features, functions and advantages of GUI.

Operating System (OS) and Graphical User Interface (GUI) – Role and functions

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Introduction, need, functions, features and types of Operating System: definition and examples of single user. ➤ Meaning of user interface and its types (CUI, GUI). ➤ Introduction to GUI and its advantages. 	<ul style="list-style-type: none"> ➤ Revisiting the concept of system software discussed in previous classes ➤ Using presentations/ Videos/ Comparative charts/ Interactive classes to explain the GUI and CUI Operating Systems to children. ➤ Discussing the different types of OS with examples. ➤ Explaining how an OS works - single user, multiuser. ➤ Providing facilities for Quizzes/worksheets and Visuals. 	<ul style="list-style-type: none"> ➤ Computers/ IWB with presentation software. ➤ Videos. ➤ Worksheets. ➤ Field trips ➤ Hands on experiences ➤ Worksheets/quiz on this topic.

Topic 2: Spreadsheet – Functions and Charts

This topic will expose children to spreadsheet is used the built-in features and tools of spreadsheets namely functions, charts, etc.

Learning outcomes:

Children will be able to:

- ☑ edit and format a worksheet;
- ☑ define cell range and apply formula;
- ☑ differentiate between different cell referencing;
- ☑ edit a sheet from sheet tab;
- ☑ formulate a function and create a chart.

Spreadsheet – Functions and Charts

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Method to enter formulae. ➤ Meaning of Range, selecting range, naming a range. ➤ Cell referencing and its types (relative, absolute, mixed –with examples). ➤ Naming, renaming and deleting a sheet from sheet tab. ➤ Meaning of Functions. ➤ Rules to enter a function like Sum, Average, Max, Min, count, etc. ➤ Creating a chart. 	<ul style="list-style-type: none"> ➤ Revising and revisiting the previous Key Concepts learnt by children by providing opportunities through presentations/ worksheets. ➤ Building on children’s previous learning. ➤ Illustrating /Demonstrating cell range, formula and function to children. ➤ Emphasizing on the different ways of cell referencing (relative, absolute, mixed –with examples) in a formula/ function. ➤ Illustrating how sheets can be edited in the sheet tab. ➤ Providing opportunities to each child through hands on experience to apply common functions like Sum, Average, Max, Min, count, etc. ➤ Asking children to collect data on two criteria (e.g. age and food preferences, gender and interest in sports, etc.) and preparing a chart on the same. 	<ul style="list-style-type: none"> ➤ Computers/ IWB with presentation software. ➤ Spreadsheet software. ➤ Questionnaires ➤ Surveys. <p>Hands-on-activities</p>

Topic 3: Algorithms and Flowcharts

An algorithm is 'rules or procedures' for solving problems and are used in all aspects of daily life activities. Two important aspects of algorithms are that the problem should be expressed in detail and without ambiguity. A Flowchart is a diagrammatic representation of an algorithm, in which different steps are shown as symbols of different shapes connected by arrows. To solve any problem, it is important to follow the stepwise strategy. This Topic focuses on enabling children to know and understand about an algorithm and flow chart and develop the ability to write an algorithm and design a flowchart for solution of a particular problem.

Learning outcomes:

Children will be able to:

- ☑ describe an algorithm;
- ☑ list characteristics of algorithm;
- ☑ analyse a problem;
- ☑ apply algorithm to find the best solution of a given problem;
- ☑ describe flowchart with its symbols;
- ☑ design a flowchart.

Algorithms and Flowcharts		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Introduction to algorithm – definition and its use. ➤ Characteristics of a good algorithm. ➤ Steps to develop an algorithm. ➤ Writing algorithms. ➤ Definition of flowcharts. ➤ Various symbols used in flowcharts. ➤ Solving problems by writing algorithms and drawing flowcharts till decision making. (excluding loops). 	<ul style="list-style-type: none"> ➤ Introducing children to the topic by asking them to list the ingredients and steps involved in making a cup of tea/ sandwich, etc. (Ingredients may be compared to the Input, steps to the Process and the cup of tea to the Output). This can then be made into a flow chart. ➤ Illustrating to children: <ul style="list-style-type: none"> • the components of algorithm and flowchart. • the steps through a flow chart. ➤ Providing children opportunities, through projects, for hands on activity. 	<ul style="list-style-type: none"> ➤ Computers/ IWB. ➤ Projector. ➤ Interactive class resources. ➤ Projects.

Life Skills: Logical thinking

Integration: Mathematics

Topic 4: Program Coding

Program coding (programming) involves the use of a computer programming language to write a series of instructions (algorithms) called a computer program that the computer can interpret and carry out. All operations performed by a computer are controlled by computer programs. Introduction of program coding (programming) can be explained by using any programming language. This Topic will be developing children's ability to write, compile and execute any program to solve the problem on a computer. They will also appreciate the need and importance of programming.

Learning outcomes:

Children will be able to:

- ☑ explain the need of programming;
- ☑ define the basic components of a program;
- ☑ explain the need of different data types;
- ☑ use correct syntax of components to write an error free program;
- ☑ compile and execute a program;
- ☑ use different operators.
- ☑ identify the flow of control in selection statements.
- ☑ design a program with appropriate selection statements.

Program Coding		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Introduction to Program coding/ programming. ➤ Components of a program: identifiers, their naming rules. ➤ Literals (like integer, real and string). ➤ Data types and the need for different data types (like int, char, float, etc.). ➤ Declaration and initialisation of variables. ➤ Arithmetic operators (+, -, *, /, %), relational and logical operators. ➤ Assignment operator and its use. ➤ Compiling and executing programs. ➤ Concept, use and syntax of <i>if</i>, <i>if else</i>, <i>if else if</i> ladder 	<ul style="list-style-type: none"> ➤ Citing examples from real life of computing being used in every field, and discussing with children the importance of learning to code. ➤ Showing videos on the importance of programming. ➤ Explaining: <ul style="list-style-type: none"> ☛ <i>different components of a program</i> ☛ <i>the correct syntax of each component</i> ☛ <i>the functionality of selection statements</i> ☛ <i>the use of selection statements by using simple examples</i> ☛ <i>how to compile and execute a program</i> ➤ Providing opportunities for Hands-on-activity to each child on the computer, 	<ul style="list-style-type: none"> ➤ Computers/ IWB with any Programming software. ➤ Internet facility. ➤ Videos ➤ Presentations. ➤ A sample structure of a program.

Topic 5: App Development

An App (abbreviation for application) is a piece of software. It can run on our mobile phone, computer, internet or any other electronic device. There are many types of Apps used for different purposes. An App can be developed using any free app development software. This topic will introduce and enable children to understand the different apps, how they work and their uses.

Learning outcomes:

Children will be able to:

- ☑ identify different types of apps;
- ☑ list uses of apps;
- ☑ classify apps;
- ☑ design and develop an app.

App Development		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Introduction to apps Working of apps. ➤ Uses of some commonly known apps. ➤ Types of apps: web or online, mobile. ➤ Development of simple apps (using any free app development software). 	<ul style="list-style-type: none"> ➤ Asking children to share their experiences of using an app by them or by any other member in their family. ➤ Demonstrating some apps on the mobile phone or through projection through computers. ➤ Illustrating the steps to create an app (using any free app development software). 	<ul style="list-style-type: none"> ➤ IWB / Computers with an app development software. ➤ Hands-on-activities on the use of app

Topic 6: Networks

This topic focuses on enabling children to know about a Computer Network and its components. They will understand that it consists of a large number of computers connected to each other so that they can exchange data and share resources and that every network has a topology, i.e., physical layout of communication links. They will also know more about the Internet -that it is a world-wide system for interconnecting smaller networks and 'cloud computing'.

Learning outcomes:

Children will be able to:

- ☑ define a network and its components,
- ☑ differentiate between types of network.
- ☑ explain the ways in which data moves over the network.
- ☑ explain Internet terms.
- ☑ discuss the need of protocols in networking.
- ☑ summarize the characteristics and advantages of cloud computing.
- ☑ use cloud computing to store, share and present data/ information.

Networks		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Definition of Network and its components (sender, receiver, medium). ➤ Definition of different types of networks with examples (LAN, MAN, WAN, PAN, CAN). ➤ Meaning of various terms related to internet: Intranet, URL, ISP, IP address, DNS, webpage, website, web portal, MODEM, switch, hub, router, gateways, link, hyperlink, hypertext, band width. ➤ Definition of protocol (HTTP, FTP, TCP/IP, IMAP, SMTP – a brief explanation of each and their purpose). ➤ Introduction to Cloud Computing: characteristics and advantages. ➤ Storing and sharing data/information using Cloud Computing. 	<ul style="list-style-type: none"> ➤ Showing the school network (the server, the cables, switch, workstations) to explain its uses, components (sender, receiver, medium) and working of different parts. ➤ Discussing and classifying the different types of networks with examples with respect to proximity, communication channels, etc. ➤ Explaining and discussing the various internet terms. ➤ Discussing protocols - a brief explanation of each and their purpose. ➤ Providing opportunities through online collaborative project to develop a better understanding of cloud computing (using shared drives and various Web 2.0 tools). 	<ul style="list-style-type: none"> ➤ Computers/ IWB. ➤ Videos. ➤ Internet facility. ➤ Interactive class resources ➤ Projectors.

*ARTS
EDUCATION*

Arts Education



The Arts are organised expressions of ideas, feelings and experiences in images, music, language, gesture and movement. They provide for sensory, emotional, intellectual and creative enrichment and contribute to the child's holistic development. Much of what is finest in society is developed through a variety of art forms which contribute to the cultural ethos and sense of well-being of an individual.

Overview

Various policy documents have recommended Arts Education as an area of immense importance for the overall development of students. Report of the Education Commission (1952-53) emphasized the "release of creative energy among the students so that they may be able to appreciate cultural heritage and cultivate rich interests, which they can pursue in their leisure and later in life" and the Kothari Commission re-emphasized the role of arts in education and stated, "The neglect of arts in education impoverishes the educational process and leads to a decline of aesthetic tastes and values."

Arts education was always recommended as an important component of the school curriculum in all National Curriculum Frameworks (1975, 1988 and 2000). The NCF 2005 recommendations brought in the major shift giving Arts Education the status of a curricular area of school education from classes I to X on one hand and arts as an approach to learning to be integrated across the complete school curriculum on the other.

At International front the UNESCO outlines the importance of Arts Education and its essential role in improving the quality of education. UNESCO's Road Map (2006) endeavors to define concepts and identifies good practices in the field of arts education, globally. It is meant to serve as an evolving reference document which outlines concrete changes and steps required to promote arts education in educational settings.

The Seoul Agenda (2010) is another important policy document of UNESCO on Arts Education. Its

three Goals for the Development of Arts Education reflect that Arts education has an important role to play in the constructive transformation of educational systems that are struggling to meet the needs of learners in a rapidly changing world characterized by remarkable advances in technology on the one hand and intractable social and cultural injustices on the other.

Objectives of Teaching and Learning Arts

Education deals with human nature, which has its own potential and pace of growth. Its objective is not to mould, but to facilitate the individual to grow and develop into a creative and productive citizen. The aim is to make an individual free to make his/her own choices in life and grow holistically. In other words, education in general and Art Education in particular is a way for one to grow and become sensitive to the beauty in nature, of social values and the aesthetic aspects of life as a whole.

The Objectives of teaching and learning Arts are:

- ✓ Awareness about oneself and one's immediate environment, from physical existence of objects to daily life experiences and their social importance.
- ✓ Development of individuality, sense of self and self-identity including personal identity and social identity.
- ✓ Opportunity for experiential learning through exploring, appreciating, creating, imagining and expressing.
- ✓ Develop sensory, kinesthetic, psycho motor and affective abilities.
- ✓ Develop cognitive abilities such as imagination, divergent thinking, critical and reflective thinking.
- ✓ Develop an understanding of art materials, methods, tools & techniques, and of processes to communicate and express ideas and feelings in different ways.
- ✓ Develop a non-verbal means of communicating ideas and seeing relationships to reinforce verbal learning.
- ✓ Develop the sensory and other skills in differently abled children (children with special needs) so as to include them in to the mainstream of the process of art learning with normal children.
- ✓ Appreciation of India's heritage and cultural diversity, and that of the world.
- ✓ Develop humane values of peaceful co-existence with nature and other human beings.

Art Education Curriculum and Suggestive Pedagogical Guidelines

Art is essential for cognitive, affective and psychomotor development of every child. It also helps them in modes of expression, visualizing, scenario building, creative problem solving, divergent, critical and reflective thinking. Arts education enhances a child's ability to understand their traditional art heritage as a national treasure and conserve and preserve it. Experiencing arts and

its explorations during the school years give them avenues to nurture creativity which makes them contributing citizens.

The Curriculum of 'Art Education' is delimited to the 'Visual Arts', which consists of; 2-D work such as; Drawing, Painting, Printing, Still-life, pen & Ink, Collage, Paper-craft, Photography, Animation, Graphic-designing etc. and 3-D work such as; Mask making, Clay-modelling, Puppet making, Sculpture, Installations etc.

Stage wise/class wise pedagogical guidelines are given in detail alongside the theme charts of curriculum outcomes, with general guidelines to assist teachers / facilitators plan and conduct the teaching learning experiences better are as given below:

Upper Primary Level

At the upper primary level children are just stepping into the period of adolescence. Physical and psychological changes are rapid and cause anxiety, mood swings, identity issues, etc. Arts education, as medium of creative and individual expression, can cater to their needs of engaging in constructive activities and channelization of thoughts and energy, which initiates a spirit to work in teams. This is the stage where children require adequate practice to develop skills in handling methods and materials, using tools and techniques of different art forms as they start analyzing their own work, as well as of others.

Profile of the Learner

Children of this stage are between the ages of 10+ to 14+ years. They are extremely self-conscious and critical of themselves due to peer and social pressures. There are many physical and emotional distractions, and diversions due to gender differences.

Content and Methodology

Content at upper primary level should cover self, family and society at large. Learning the skills to explore and express emotions through different art Experiences. Learning and understanding of regional arts and crafts to appreciate the national heritage and cultural diversity as value. Study of environmental and social issues and understanding of elements and principals of visual arts.

Methodology at this stage should be focused on experiential learning. Adequate time and space is to be given for exploration and experimentation with methods and materials. Teachers should ensure the participation of each child including those with special needs. Art experiences should be organized in such a way that it provides opportunities for individual as well as group assignments and presentations. Children should be encouraged to take the lead in the planning, designing and executing of different classroom and school programs. Art experiences should be designed and utilized to address values and life-skills. Exposure through media, field visits and community celebrations, where children and teachers interact and share responsibilities. Additional emphasis should be on

the process than the product. Wherever possible, art should be integrated with content of other subjects, for better understanding and joyful learning of concepts.

All activities whether individual or group, should be evaluated and tools and techniques for this stage recommended are; observation, interactions, portfolios, worksheets, display, presentations, visits, documentation and report etc.

Visual Arts Education

Visual arts education is the area of learning that is based solely on the kind of art that one can see which includes drawing, painting, print making, collage, textiles, sculpture, artefacts and design in jewellery, pottery, weaving, fabrics, etc. and design applied to more practical fields such as commercial graphics and home furnishings. The different types of visual arts are highlighted below.

Drawing



Drawing is a means of making an image, using any of a wide variety of tools and techniques. It generally involves making marks on a surface by applying pressure from a tool, or moving a tool across a surface using dry media such as graphite pencils, pen and ink, inked brushes, wax colour pencils, crayons, charcoals, pastels, and markers.

Painting



Painting is the practice of applying paint, pigment, colour or other medium to a solid surface. The medium is commonly applied to the base with a brush, but other implements, such as knives, sponges, and airbrushes, can also be used. Painting is a mode of creative expression, and the forms are numerous. Drawing, gesture, composition, narration, or abstraction, among other aesthetic modes, reflect the expressive and conceptual intention of the artist.

Print making



Print making is the process of making artworks by printing, normally on paper that involves the making of a work of art by transferring ink from the surface upon which the work was originally drawn or otherwise composed to another surface.

Collage



Collage is a technique of an art production, primarily used in the visual arts, where the artwork is made from an assemblage of different forms, thus creating a new whole. A collage may sometimes include magazine and newspaper clippings, ribbons, paint, bits of coloured or handmade papers, portions of other artwork or texts, photographs and other found objects, glued to a piece of paper or canvas.

Textiles



Textiles are arts and crafts that use plant, animal and or synthetic fibres to construct practical or decorative objects. The textile arts also include those techniques which are used to embellish or decorate textiles – dyeing and printing to add colour and pattern; embroidery and other types of needlework; tablet weaving; and lace-making.

Three Dimensional Work



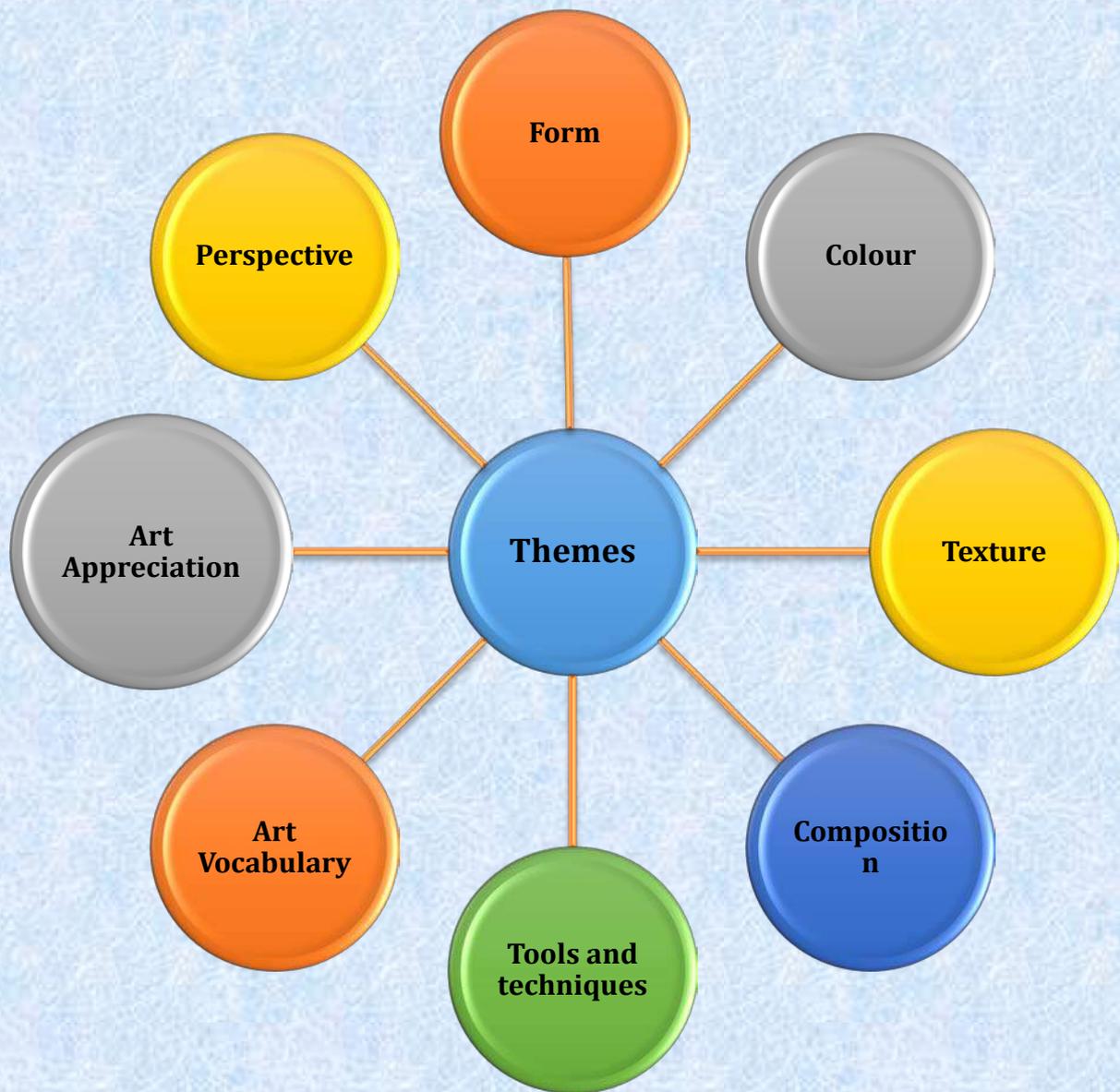
Three-dimensional art design is comprised of three main elements: balance, proportion and rhythm. Balance denotes visual balance and not the actual ability to stand upright. Proportion refers to the various parts of the three-dimensional object. The parts need to give the appearance of belonging together. Rhythm is the repetition of line or shape within the overall form.

Art & Artefacts



An artefact is something made or given a shape by man, such as a tool or a work of art, especially an object of archaeological interest. Examples include stone tools, pottery vessels, metal objects such as weapons, and items of personal adornment such as buttons, jewellery and clothing.

At the upper primary level the themes dealt with in the curriculum for Classes VI , VII and VIII are presented below, there are seven totally.



Theme 6

Art Vocabulary



Identification of tools, papers and materials with their names. Names of techniques, such as: drawing, painting, folding, stretching, printing, block impression, spray work, blow painting and thumb painting. Names of colours, shapes, sizes, words of appreciation etc.

Theme 7

Art Appreciation or Responding to Artefacts and Nature



Appreciation of artefacts and nature around us, understanding of visual representation of objects, situations and concepts.

Theme 8

Perspective



The way in which objects appear to our eyes based on their spatial dimensions, and position of our eye in relation to that object.

All the eight themes will be dealt with in the sequence given above. Each theme will deal with Classes VI, VII and VIII.

Theme 1: Form

The theme 'Form' aims at developing in children an understanding of line, shape and size of objects. The prime focus of this theme is to observe and identify lines and shapes in nature and in man-made objects from the immediate surroundings. Understanding of sizes such as: small, big, tall, huge, tiny etc., and creation of different forms with 2-D and 3-D materials. The process of identification of forms enhances skills, such as; observation, exploration, concentration and creative expression.

Learning Outcomes:

Children will be able to:

- ☑ differentiate between geometrical and natural forms, realistic and abstract forms in the given artefacts;
- ☑ create border designs using geometrical patterns from their imagination;
- ☑ draw human forms in action, such as; sports scene, people crossing road, someone running to catch the bus;
- ☑ create theme based forms and designs;
- ☑ demonstrate use of extended vocabulary related to form;
- ☑ engage and explore various sites and immediate surroundings for the joy of knowing more.

Form

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Differentiate between geometrical and natural forms, realistic and abstract forms in the given artefacts. ➤ Create border design using geometrical patterns from imagination. ➤ Draw human forms in action, such as; sports scene, people crossing road, someone running to catch the bus. ➤ Create theme based forms and designs. ➤ Demonstrate use of extended vocabulary related to the theme. ➤ Engage and explore various sites and immediate surroundings for the joy of knowing 	<ul style="list-style-type: none"> ➤ Providing opportunities to children to explore and observe and thus develop an understanding of different forms, such as; <ul style="list-style-type: none"> ☛ geometrical and natural forms, ☛ realistic and abstract forms, ☛ 2-D and 3-D forms of objects and artefacts. ➤ Providing opportunities for children sharing their individual experiences related to different type of forms. Suggested areas of sharing can be; interesting forms of home furniture, school furniture, people at work, local Fairs (Melas), different forms of buildings and bridges in the immediate surroundings. ➤ Organising classroom activities to make border designs based on imagination for a Handkerchief, Saree, for a Wall or Floor, while using lines and geometrical shapes. 	<ul style="list-style-type: none"> ➤ Children's own learning experiences of forms related to furniture items, building/architecture, nature, human figures etc. ➤ Sketchbooks and art work of children. ➤ Children's Scrap books. ➤ Picture cards/ placards, video clips on different forms. ➤ Drawing and painting materials, local specific, low cost art materials. ➤ Art Room with working tables of appropriate height ➤ Computers with relevant soft wares and LCD projector for ICT based art experiences of varied forms.

Form

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
more.	<ul style="list-style-type: none"> ➤ Creating human forms in action, such as; sports scene, people crossing road, someone running to catch the bus, etc. in drawing and painting or while using local specific materials for construction. ➤ Creating theme based forms / designs, such as; ' Happy me', 'Happy Family', 'Tree Plantation', 'Fishing Day Out' etc. for decorating earthen pots. ➤ Organising classroom discussions based on placards/ pictures/video clips etc. on different type of forms, such as; <ul style="list-style-type: none"> ☛ What is the difference between realistic and abstract forms? ☛ What is the difference between geometrical and natural forms? ➤ Using computer graphics to explore and understand the beauty and diversity of forms. <p><i>Integration with other subjects</i></p> <p><i>Languages</i></p> <ul style="list-style-type: none"> ➤ Providing opportunities for children to make poems/ songs on different theme based designs to develop verbal expression. ➤ Engaging children in the upkeep of the classroom after the art activity (to learn cleanliness, beautification and working together). 	<ul style="list-style-type: none"> ➤ Camera. ➤ White board or classroom board/s. ➤ Easels /stands. ➤ Water arrangements. ➤ Potter's clay. ➤ Origami paper. ➤ Aprons and towels.

Life Skills: Developing skills of observation, problem solving, communication and cooperation by becoming aware of the immediate surroundings. Accepting responsibility of the beautification and cleanliness of the environment through active participation.

Theme 2: Colour

The theme 'colour' aims at developing an understanding of different colours on one hand and developing aesthetic sensibility on the other in children. The prime focus of this theme is to observe and identify colours in nature and in man-made objects. Understanding relationship of certain colours with plants, flowers, fruits and nature. For example, leaf green, sea blue & sky blue, bottle green, lemon yellow etc. Creation of different shades by mixing of two different colours. For example; mixing of red and yellow in equal quantity will create orange colour.

It will also develop an understanding relationship of colours with different subjects and emotions. For example, bright colours for joyful compositions and dull and grey shades for sad subjects. Contrast colours to break the monotony, bold use of warm colours to depict force and of cool colours to depict peace and harmony, etc. The process of identification and understanding of colours enhances skills, such as; observation, exploration, experimentation and artistic expression.

Learning Outcomes:

Children will be able to:

- ☑ differentiate between primary, secondary and tertiary colours;
- ☑ describe quality of art work based on its colours;
- ☑ draw and paint images from their immediate surroundings and colour them with appropriate colours;
- ☑ use neutral colours (black and white) and create chart of grey tones/scales of all primary and secondary colours;
- ☑ understand and use theme appropriate colours in compositions;
- ☑ demonstrate use of extended vocabulary related to colour;
- ☑ link the experience and understanding of colours with learning in other subjects;
- ☑ appreciate the beauty of colours in nature and in man-made objects.

Colour		
Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Differentiate between primary, secondary and tertiary colours. ➤ Describe quality of art work based on its colours. ➤ Draw and paint images from immediate surroundings and colour them with their appropriate colours. ➤ Use neutral colours (black and white) and create chart of grey tones/scales of all primary and secondary colours. ➤ Understand use of theme 	<ul style="list-style-type: none"> ➤ Motivating children to make keen observations of primary, secondary and tertiary colours in nature and in artificial objects for making note of colours and their shades. ➤ Encouraging exploration of children's immediate surroundings by conducting visits to shopping centres, fruit and vegetable markets, fairs /melas, events, gardens, zoo etc. for learning more about colours of natural and artificial objects, structures and sceneries. their likes and dislikes, importance and value of colours to them. ➤ Providing opportunities for sharing of personal experiences by children about 	<ul style="list-style-type: none"> ➤ Children's own experience related to colours and shades. Their likes and dislikes, importance and value of colours to them. ➤ Theme based scrap book on colours and shades. ➤ Shopping centres, fruit and vegetable markets, fairs /melas, events, gardens, zoo etc. ➤ Picture cards on tones and shades of different colours, art works of

Colour

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<p>appropriate colours in compositions.</p> <ul style="list-style-type: none"> ➤ Demonstrate use of extended vocabulary related to the theme. ➤ Link the experience and understanding of colours with learning of other subjects of their class. ➤ Appreciate beauty of colours in nature and in man-made objects around him/her. 	<p>colours around them such as:</p> <ul style="list-style-type: none"> ➤ Encouraging children to make their own colour charts of 8-10 tones of every primary colour, using neutral colours (white and black), and shades of secondary colours. ➤ Using computer and computer software for mixing and making colours. Using painting software for seeing variation in effects of different colours and shades on a selected composition. ➤ Conducting activities on drawing, colouring or clicking objects based on colour themes such as: <ul style="list-style-type: none"> ☛ 'Green around us'. ☛ 'Red around us', Yellow around us' 'Varieties of blue' etc. ➤ Discussing the use of theme based colours in art work. Using sample cards, video clips, paintings and prints of work of renowned artists. Ask questions such as; <ul style="list-style-type: none"> ☛ Why he/she has used red colour in this work? ☛ What do you think of white/yellow here in this composition? ➤ Conducting practice sessions to describe own work and work of peers based on use of different colours. ➤ Making social theme based Rangolis using different materials. 'Save girl child', 'save water', 'save tigers' 'our planet earth' etc. <p>Integration with other subjects:</p> <p>Languages:</p> <ul style="list-style-type: none"> ➤ Facilitating children to create poem/s on colours of your choice. (individual activity) <p>➤ Maths:</p> <ul style="list-style-type: none"> ➤ Making Rangolis on different topics, using mathematics skills and concepts. 	<p>artists, video clips to study the use of different colours.</p> <ul style="list-style-type: none"> ➤ Drawing and painting materials, sheets, pigments, paints, inks and dyes, powder colours, sawdust, sand, etc. ➤ Thread, sponge, straw, paper cuttings, etc. ➤ Art Room with working tables of appropriate height, slabs on sides. ➤ Easels /stands. ➤ Cameras. ➤ Computers with relevant software and LCD projector for ICT based art experiences. ➤ Boards for art displays. ➤ Aprons and towels. ➤ Water arrangements.

Life Skills: Developing skills of observation, problem solving, communication and cooperation, and working together. Also, acceptance of the social multiple perspective by exploring and knowing about their immediate surroundings in teams and accepting responsibility of its cleanliness and beautification through participation.

Theme 3: Texture

The theme "Texture" is aimed at developing in children an understanding of different textures and surfaces. The prime focus of this theme is to observe, identify and create textures. Understanding relationship of certain textures with plants, trees, flowers, fruits, furs, feathers, wool, sand, fabric, etc. For example, fur is soft, sand is rough, bark of a tree is rough, etc. Creation of different textures and surfaces by using mix mediums and materials. For example; sand painting, impression of bark on clay slab etc. Experience with different textures can sharpen the sense of touch among all learners, including those with special needs. The process of identification, understanding and creation of texture enhances skills, such as; observation, imagination, experimentation and artistic expression.

Learning Outcomes:

Children will be able to:

- ☑ identify and describe different textures and surfaces of natural objects and those of household items;
- ☑ depict different type of textures such as; rough, smooth, silky, hard, soft, sandy, wooden, etc. using drawing and painting techniques;
- ☑ create new textures with 3-D methods and materials;
- ☑ appreciate beauty, variety and value of different surfaces in work of arts;
- ☑ demonstrate use of extended vocabulary related to texture;
- ☑ link the experience and understanding of textures with learning of other subjects.
- ☑ engage and learn to observe and explore immediate surroundings for joy of knowing and experiencing different surfaces and textures.

Texture		
Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Identify and describe different textures and surfaces of natural objects and those of household items. ➤ Depict different type of textures such as; rough, smooth, hard, soft, sandy, wooden, etc. using drawing and painting techniques. ➤ Create new textures with 3-D methods and materials. ➤ Appreciate beauty, variety and value of different surfaces in work of arts. ➤ Demonstrate use of extended vocabulary related to the theme. 	<ul style="list-style-type: none"> ➤ Conducting an 'Exploration Walk' in and around the school to encourage observation, and exploration of different textures and surfaces through touch and feel. ➤ Exploration walk in the immediate surroundings at different times of the day and in different weathers to experience different textures and surfaces. ➤ Providing opportunities for children sharing experiences on variety of textures and surfaces, they have come across. ➤ Organising drawing and painting activities to create textures, such as; rough, smooth, silky, hard, soft, sandy, wooden, etc. 	<ul style="list-style-type: none"> ➤ Children's own experiences related to household objects, ➤ Natural objects, plants & trees, birds & animals, sand and soil of different kinds, etc. ➤ Children's Scrap books on materials having different textures. ➤ Sample pictures and videos of different surfaces. ➤ Drawing & painting materials, Glue, sponge, pieces of different fabrics, sand, bark, wool, feathers, potters clay, samples of soil, etc.

Texture

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Learn to link the experience and understanding of textures with learning of other subjects of their class. ➤ Engage and learn to observe and explore immediate surroundings for joy of knowing and experiencing different surfaces and textures. 	<ul style="list-style-type: none"> ➤ Using 3-D materials to experiment and create new textures and name them. ➤ Discussing the value of texture in work of art by making use of children's work, scrap books, relevant pictures and video clips on theme. ➤ Exploring new textures with the help of computer software. ➤ Conducting Play games such as 'Touch and Tell' to identify textures while being blindfolded. (classroom activity). <p>Integration with other subjects: Languages:</p> <ul style="list-style-type: none"> ➤ Facilitating children to create poem or story describing textures of opposite nature. (individual activity) 	<ul style="list-style-type: none"> ➤ Art Room with working tables of appropriate height, slabs on sides ➤ Cameras for clicking pictures. ➤ Easel /stand ➤ Computers with relevant software and LCD projector for ICT based art experiences. ➤ Boards for art displays ➤ Aprons and towels ➤ Water arrangements

Life Skills: Developing skills of observation, empathy and compassion for nature and for animals by observing and understanding of the nature. Accepting responsibility of environment protection through participation in its upkeep.

Theme 4: Composition

The theme 'composition', particularly in visual arts (painting, printing, graphic design, sculpture, installation etc.) aims at developing children's understanding about the placement or arrangement of visual elements and organisation of the space (2-D and 3-D both). The prime focus of the theme is on artistic placement of colours and forms, painting of landscapes, seascapes, composition based on seasons, sports, parks, situations, arranging patterns, making designs, installation of 3-D objects, still life, graphic designs, crafts etc. In the visual arts, composition is often used interchangeably with various terms such as design, visual ordering or formal structure, depending on the context. Another aspect this theme focuses on is to develop the ability in children to observe and find out compositions in nature, and in man-made structures. It will help children to understand the relationship of one object with another, form with the colours, objects with the overall theme, and finally the visual impact of the work of art. For example, in a composition of the 'Rainy Day', the form of clouds, the lines of falling rain drops, colours supporting mood of the weather, and finally the visual impact of a composition, all are interrelated and interdependent. The process of visualizing and making composition enhances skills, such as; observation, imagination, experimentation, communication and artistic expression.

Learning Outcomes:

Children will be able to:

- ☑ use view finder to select composition of landscapes/seascapes from the immediate surroundings;
- ☑ know the elements of composition, namely; Balance, Movement, Rhythm, Focus, Contrast, Pattern and Proportion;
- ☑ draw and paint compositions on themes, such as; my family, my school, festival/s I like the hockey/football/cricket/basketball match of my school, the game I like the most, landscape, seascape, from imagination;
- ☑ compose posters on social and environmental issues, such as; 'Save the Girl Child', 'Help Senior Citizens', 'Save Trees', 'Save Tigers', 'Save Water', 'Keep your Surroundings Clean';
- ☑ arrange and create 3-D objects on the given theme;
- ☑ demonstrate use of extended vocabulary related to the theme composition;
- ☑ link the experience gained while creating composition, with learning of other subjects of their class;
- ☑ engage and learn to observe and explore immediate surroundings for joy of knowing different compositions;
- ☑ communicate and express arrangement of visual images.

Composition

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Use view finder to select composition of landscapes/seascapes from the immediate surroundings. ➤ Know the elements of 	<ul style="list-style-type: none"> ➤ Encouraging an independent exploration of interesting locations in and around school and home, with view-finder. ➤ Organising guided trips to give adequate exposure of social as well as 	<ul style="list-style-type: none"> ➤ Household objects, landscapes/seascapes, arranging idols during poojas, special days, festivals etc. ➤ View finder, Picture cards

Composition

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<p>composition, that is; Balance, Movement, Rhythm, Focus, Contrast, Pattern and Proportion.</p> <ul style="list-style-type: none"> ▶ Draw and paint compositions on themes, such as; my family, my school, festival/s I like, Hockey/Football /Cricket/basketball match of my school, game I like the most, landscape, seascape, etc., from imagination. ▶ Compose poster/s on social and environmental issues, such as; 'Save Girl Child', 'Help Senior Citizens', 'Save Trees', 'Save Tigers', 'Save Water', 'Keep your surrounding Clean' etc. ▶ Arrange and create 3-D objects on the given theme. ▶ Use of extended vocabulary related to compositions. ▶ Engage and learn to explore immediate surroundings for the joy of knowing more. ▶ Link experience and understanding of composition with learning of other subjects of their class. 	<p>natural situations for the quality and variety of compositions.</p> <ul style="list-style-type: none"> ▶ Promoting the sharing of children's own experiences in relation to household objects, landscapes/seascapes, arranging idols during poojas, special days, festivals etc. ▶ Organising session on quick sketching of the selected compositions with pencil or with dry pastels. Encouraging the use of personal sketchbook. ▶ Organising guided and independent exploration/walks to green / forest areas, zoos, school garden, historical monuments, to the fairs/melas, sports complexes and to the social gathering /celebrations for making sketches. ▶ Encouraging children to make use of camera/s to click compositions which can be displayed and also used for developing art work. ▶ Organising activities of drawing and/or painting of imaginary compositions on social themes, such as; <ul style="list-style-type: none"> ☛ <i>My family,</i> ☛ <i>My school,</i> ☛ <i>My village/ community,</i> ☛ <i>Our festival/s,</i> ☛ <i>Hockey/ Football/ Cricket match of my school, Landscapes, seascapes etc. etc.</i> ▶ Helping in making poster/s on social and environmental issues, such as; Save the Girl Child', 'Help Senior Citizens', 'Save Trees', 'Save Tigers', 'Save Water', 'Keep your Surrounding Clean' etc. ▶ Providing opportunities to create 3-D composition/s on themes, such as; 'Furniture in my room', 'Garden furniture', 'Gym in the park', 'Means of 	<p>and Videos depicting different compositions.</p> <ul style="list-style-type: none"> ▶ Sketch books of children. ▶ Drawing/painting materials, clay, adhesive, card board, Rangoli materials, etc. ▶ Art Room with working tables of appropriate height, slabs on sides. ▶ Camera. ▶ Computers with relevant soft wares and LCD projector for ICT based art experiences. ▶ Boards for art displays. ▶ Easels /stands. ▶ Aprons and towels. ▶ Water arrangements.

Composition

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
	<p>Transportation' etc., and installation of the same.</p> <ul style="list-style-type: none"> ➤ Discussing the elements of composition to understand the secret of beauty in a composition. Examples should be related to the immediate environment of the children. ➤ Showing video clips and original work of different artists for motivating children. <p>Integration with Other Subjects:</p> <p>Languages:</p> <ul style="list-style-type: none"> ➤ Facilitating children to narrate their experiences on a theme/ topic related to the selected composition. ➤ Writing a letter to a friend describing best composition seen during a gallery/museum visit. 	

Life Skills: Developing skills of problem solving, visualization, communication, cooperation and interpersonal relationship by observing, imagining and arranging compositions on their immediate surroundings and of other places of social and historical importance. Accepting responsibility of keeping the environment /surrounding clean and maintaining beautifying it through active participation.

Theme 5: Tools & Techniques

The theme 'Tools and Techniques' is aimed at developing an understanding in children of the different tools and techniques used for experiencing the visual arts. The prime focus of this theme is to enable children to identify, experiment and understand the appropriate use of different tools, materials and techniques used in visual arts. It will also help them to understand the relationship of tools and materials with that of the techniques. For example, knowledge of brushes, blocks, nibs & holders/pens for inks and their maintenance.

Children will also be able to handle different tools, materials and techniques. For example; Use of soft but flat brushes (of bigger number) for broader strokes, Round brushes for drawing lines of varied thickness, dry colours (pencils, wax crayons, pastels etc.) for drawings, inks for quick and transparent drawings and blow printing, glue/adhesives for fixing of paper cuttings and other materials for making collages, softness of clay for slab, coil and pinching method, converting clay models in to terracotta, etc. Use of light and shade, ratio - proportion for arranging and making still life, knowing camera adjustments for clicking good pictures, knowing computer software for exploring and using computers for art experience. Knowing soft stone and wood for carving and sculpture, etc. The process of knowing and working with the tools and techniques enhances skills, such as; observation, experimentation, problem solving and free expression.

Experience with different tools and techniques will also aim at sharpening their common sense and making them confident users and creators.

Learning Outcomes:

Children will be able to:

- ☑ identify and name the age/stage appropriate tools and materials including camera and computer and computer software/s;
- ☑ understand and apply the age appropriate techniques of visual expression, such as; drawing, still life, poster making, painting composition, pen & ink drawings, block printing, 2-D and 3-D work, origami, coil, slab and pinching methods of clay modelling, terracotta, engraving and relief work on 3-D materials, 3-D masks and puppets, simple crafts (local specific) rangoli, wall painting, photography, animation (manual and computer based);
- ☑ create their own tools and techniques of visual expression;
- ☑ maintain their tools and equipment of use;
- ☑ demonstrate use of extended vocabulary related to tools and techniques;
- ☑ learn to link the experience and understanding of tools and techniques with learning of/in other subjects;
- ☑ appreciate beauty and variety of methods and materials for visual expression.

Tools and Techniques

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Identify and name the age and stage appropriate tools and materials including camera, computer and computer software/s. 	<ul style="list-style-type: none"> ➤ Providing opportunities for children in sharing experiences on use and preferences regarding different tools, materials and techniques, used or seen. 	<ul style="list-style-type: none"> ➤ Children's experience with different tools techniques. Collection and display of age appropriate art tools, techniques and materials

Tools and Techniques

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<ul style="list-style-type: none"> ▶ Understand and apply the age appropriate techniques of visual expression, such as; drawing, still life, poster making, painting composition, pen & ink drawings, block printing, 2-D and 3-D work, origami, coil, slab and pinching methods of clay modelling, terracotta, engraving and relief work, 3-D masks and puppets, simple crafts (local specific) rangoli, wall painting or graffiti, photography, animation (manual and computer based), etc. ▶ Create their own tools and techniques of visual expression. ▶ Demonstrate use of extended vocabulary related to the theme. ▶ Maintain their tools and equipment of use. ▶ Create small poem or song on tool/s of their liking. ▶ Integration of knowledge & experience of tools, materials and techniques with learning of other subject. ▶ Appreciate beauty and variety of methods and materials for visual expression. 	<ul style="list-style-type: none"> ▶ such as drawing, still life, poster making, painting composition, pen & ink drawings, block printing, 2-D and 3-D work, origami, coil, slab and pinching methods of clay modelling, terracotta, engraving and relief work, 3-D masks and puppets, simple crafts (local specific) rangoli, wall painting, photography, animation (manual and computer based), etc. ▶ Encouraging active participation in the collection of tools and materials from home, community and from the immediate surroundings. ▶ Conducting Question Answer sessions in class in 'Do you know?' format, such as; <ul style="list-style-type: none"> ☛ <i>Name any 5 tools of drawing and painting.</i> ☛ <i>Which are the materials that you have seen and used for the drawing and painting so far?</i> ☛ <i>Name any 5 printing tools/equipments/materials you know?</i> ☛ <i>What is a mixed collage?</i> ☛ <i>What precautions should you take while working with pen and ink?</i> ☛ <i>What material/s have you used for making your Block for printing?</i> ☛ <i>What is the difference between clay modelling and Terracotta?</i> ☛ <i>What method of mask making do you like?</i> ☛ <i>Which Camera do you use for taking pictures? Describe the camera.</i> ☛ <i>Which computer software have you used for animation?</i> ▶ Facilitating learning of new technique/s and use of new tools through demonstration method. For example; 	<p>in</p> <ul style="list-style-type: none"> ▶ Collection and display of local specific /easily available tools and materials in the art room/classroom. ▶ Local artists and artisans. ▶ Age appropriate samples in form of pictures or videos of different art methods and techniques. ▶ Drawing painting and printing materials such as glue, sponge, pieces of different fabrics, sand, bark, wool, feathers, potters clay, etc. ▶ Art Room with working tables of appropriate height, slabs for 3-D work and display on sides. ▶ Computers with relevant soft wares and LCD projector for ICT based art experiences. ▶ Cameras. ▶ Easels /stands. ▶ Boards for art displays. ▶ Aprons and towels. ▶ Water arrangements

Tools and Techniques

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
	<ul style="list-style-type: none"> ☛ Drawing of still life ☛ Using the potter's wheel; ☛ Making a poster based on its elements; ☛ Engraving tools which can be used on soft wood; and ☛ Maintenance of tools, etc. ➤ Making of a wall painting or graffiti as these involve the use of local specific tools, technique/s, materials, motifs and composition. ➤ Organising a visit to the local artists/artisans to see the process involved and the tools and equipment they use for their art. ➤ Conducting class quiz or competitions for testing of their knowledge about tools, materials and techniques of visual expression and also to encourage further innovations. ➤ Organising Annual group show of classroom activities on tools, techniques and materials. ➤ Making replicas of Harrapan seals and toys in terracotta. <p>Integration with Other Subjects:</p> <p>Languages:</p> <ul style="list-style-type: none"> ➤ Encourage children for creating poems and/or stories on printing roller/ printing table, etc. in small groups. ➤ Script of role play, such as; <ul style="list-style-type: none"> ☛ 'I am clay', ☛ 'I am your new sketchbook', ☛ 'I am your colour plate', etc. ☛ (story making can cover it's making process, its use, its value, etc.) 	

Life Skills: *Developing skills of problem solving and perseverance by using different tools and materials of creative expression. Also, confidence of learning to handle tools and materials and joy of learning the appropriate techniques to express through. An increase in the participation for cleaning and beautification of own's classroom, school and home and environment.*

Theme 6: Art (Visual Arts) Vocabulary

The theme 'Art Vocabulary' is aimed at children learning and using appropriate names and terms related to art techniques, hues and shades of colours, tools and accessories used and different mediums and materials and for appreciating a work of art. The process of knowing and using appropriate vocabulary will enhance the communication skills of the learner. The prime focus of this theme is to know, to remember, and to use art related vocabulary appropriately. For example, block printing is done with the blocks, block printing is a technique which is used to take same kind of impression again and again. Soft paint-brushes are used for doing water based colours, flat brushes (of bigger number) are used for broader strokes whereas round brushes are used for drawing lines of varied thickness, slab method and coil method are techniques of making 3-D objects with potter's clay, terracotta is the result of baking clay models at an appropriate temperature, perspective is a skill for making 2-D objects and sceneries look 3-D, use of different colours can help in creating different effects in an art work, composition is a grouping of different objects/forms and colours in a visually pleasant manner, animation is a technique which provides movement to the graphics, etc.

Learning Outcomes:

Children will be able to:

- ☑ identify and name different tools and techniques, such as; round brushes, flat brushes, hard and soft brushes, type of scissors, rollers/rolling pins, drawing & painting, printing, clay modelling, terracotta, pottery, spray painting, reverse techniques, origami, construction, engraving, round and relief work, paper craft, photography, animation, light and shade, still life, graphics, perspective;
- ☑ name terms/specifications used in visual arts, such as; types of colours, medium of colours, water colours, pastel colours, neutral colours, shades and tones of colours, paints, pen & ink, background and foreground in the composition, perspective; linear and aerial, landscapes, seascapes, lines of different types, geometrical shapes and sizes, modelling, still life, wall painting, graffiti, photography;
- ☑ describe own art work and that of their peers, using appropriate terms and vocabulary;
- ☑ narrate art experiences confidently;
- ☑ write a note on given art work using appropriate vocabulary;
- ☑ learn to link the knowledge of art vocabulary with learning of/in other subjects.

Art Vocabulary		
Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Identify and name different tools and techniques, such as; round brushes, flat brushes, hard and soft brushes, type of scissors, rollers/rolling pins, drawing and painting, printing, clay modelling, terracotta, pottery, spray painting, reverse 	<ul style="list-style-type: none"> ➤ Encouraging use of appropriate art vocabulary by children while sharing their knowledge and experience about art tools, techniques and materials. ➤ Providing opportunities to every child to analyse their own art work and also the art work of their peers and artists to practice the use of art vocabulary. ➤ Organising classroom discussions on different art techniques, quality of 	<ul style="list-style-type: none"> ➤ Children's scrap books on tools and materials of visual arts, with their name or title. (<i>The scrap books should cover all the tools, materials, including that of the local ones.</i>) ➤ Children's portfolios of art activities. ➤ Samples of paintings,

Art Vocabulary

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<p>techniques, origami, construction, engraving, round and relief work, paper craft, photography, animation, light and shade, still life, graphics and perspective.</p> <ul style="list-style-type: none"> ▶ name terms/specifications used in visual arts, such as; types of colours, medium of colours, water colours, pastel colours, neutral colours, shades and tones of colours, paints, pen and ink, background and foreground in the composition, perspective; linear and aerial, landscapes, seascapes, lines of different types, geometrical shapes and sizes, modelling, still life, wall painting, graffiti, photography, etc. ▶ Describe own art work and that of their peers, using appropriate terms and vocabulary. ▶ Narrate art experiences confidently. ▶ Write note on given art work using appropriate vocabulary. ▶ Link the knowledge of art vocabulary with learning of other subjects. 	<p>materials and value of art tools, such as; brushes, type of scissors, printing rollers/ rolling pins, drawing & painting, printing, clay modelling, terracotta, pottery, spray painting, reverse techniques, origami, construction, round and relief work, 2-D and 3-D arts, paper craft, etc.</p> <ul style="list-style-type: none"> ▶ Encouraging children to explain terms such as; perspective (linear and aerial), landscapes, seascapes, lines of different types, geometrical shapes and sizes, modelling, still life, wall painting, graffiti, photography, animation etc. ▶ Providing opportunities to children to view art related pictures and videos followed by taking quick observations of every child, to encourage verbal expression among children. ▶ Encouraging presentation/s on tools, colours, different medium and materials, different techniques, art work in school corridors, etc. This can be done either through scrap books or Power Point Presentation (PPT). ▶ Organising children’s visits to local museums, galleries, art exhibitions, craftsmen, potter, etc. and writing notes on their field experiences, using appropriate vocabulary. ▶ Helping children in writing a review after a visit to the gallery. <p>Integration with other Subjects:</p> <p>Languages:</p> <ul style="list-style-type: none"> ▶ Encouraging children in writing letter/s, stories, describing their experiences of the field visit to museum, by using appropriate vocabulary. ▶ Facilitating the writing of an 	<p>photographs, of selected compositions, slides, videos of art camps and exhibitions etc.</p> <ul style="list-style-type: none"> ▶ Collection and display of age appropriate art tools and materials in the class. This also includes the local specific and easily available tools and materials. ▶ Drawing and painting materials, potters clay, etc. ▶ Computers with relevant soft wares and LCD projector for ICT based art experiences. ▶ Cameras. ▶ Boards for art displays.

Art Vocabulary

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
	<p>imaginary dialogue;</p> <ul style="list-style-type: none">• <i>between the objects in a given composition,</i>• <i>between printing roller and the print, between potter's clay and potter, between fire and terracotta, etc.</i>	

Life Skills: Learning based on this theme will help in developing skills of observation, communication and free expression. It will also develop confidence of knowing words and terms for different tools and materials, methods and techniques and joy of free expression and can also enhance creativity.

Theme 7: Responding to the Artefacts and Nature

The theme "Responding to the Artefacts and Nature" is aimed at children knowing, understanding and appreciating the beauty of nature and the artefacts. The prime focus of this theme is to make children understand the beauty and value of arts, of nature as well as man-made objects, structure and architecture. The process of appreciation will sensitize their eye for aesthetics of an object, subject and situation. The process of responding to the artefacts and nature will enhance the skills of; observation, exploration, critical analysis interpersonal relations, effective communication and artistic expression. It will help in developing in children an attitude for accepting and appreciating multiple perspectives on any given subject or situation.

Learning Outcomes:

Children will be able to:

- ☑ describe the objects, buildings, structures, scenes and situations of their liking in the immediate surroundings;
- ☑ appreciate nature and natural beauty such as; plants, trees, buds, flowers, birds, animals, ponds, lakes, pastures, deserts, sea beaches, rivers, mountains, sky with and without clouds, wind, rain, sun, moon, stars, rainy day, starry night and sunny day. based on its lines, forms, colours, composition and perspective;
- ☑ respond to the impact of art done by their classmates and self;
- ☑ identify the elements of visual arts in a given art work;
- ☑ describe the artefacts displayed in galleries and museums, such as; paintings, prints, pottery, terracotta and sculptures, installations, local crafts for its artistic rendering;
- ☑ write an appreciation note on their experience of the art museum and art gallery while describing a few artefacts seen;
- ☑ demonstrate use of extended vocabulary related to responding to the artefacts and nature;
- ☑ link the knowledge of appreciation and responding to the nature and to the artefacts with learning of other subjects.

Responding to the Artefacts and Nature

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Describe the objects, buildings, structures, scenes and situations of their liking in the immediate surroundings. ➤ Appreciate nature and natural beauty such as; plants, trees, buds, flowers, birds, animals, ponds, lakes, pastures, deserts, sea beaches, rivers, mountains, sky with and without clouds, wind, rain, sun, moon, stars, rainy day, 	<ul style="list-style-type: none"> ➤ Encouraging and providing opportunities to every child to explore and experience the beauty of nature and natural objects, building architecture and structures, scenes and situations in their immediate surroundings. ➤ Encouraging sharing/ of art experiences and appreciation of art objects and compositions of their liking by every child individually. ➤ Providing opportunities for children to give observations on their own art and also on art activities/ experiences of 	<ul style="list-style-type: none"> ➤ Children's own experiences, likes and dislikes on nature and natural objects, on artefacts and architectural sites in the immediate surroundings. ➤ Art work of every child in the class. ➤ Samples/replicas of artists work in 2-D and 3-D, pictures or videos of artists' work. ➤ Power Point Presentation

Responding to the Artefacts and Nature

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<p>starry night and sunny day, based on its line, form, colours, composition and perspective.</p> <ul style="list-style-type: none"> ➤ Respond to the impact of art work done by their classmates and self. ➤ Identify the elements of visual arts in a given art work. ➤ Describe the artefacts displayed in galleries and museums, such as: paintings, prints, pottery, terracotta and sculptures, installations, local crafts, etc. for its artistic rendering. ➤ Write an appreciation note on their experience of the art museum and art gallery while describing a few artefacts seen. ➤ Learn to link the knowledge of appreciation and responding to the nature and to the artefacts with learning of other subjects. 	<p>peers, periodically.</p> <ul style="list-style-type: none"> ➤ Worksheet/s on appreciation of nature and natural beauty such as; plants, trees, buds, flowers, birds, animals, ponds, lakes, pastures, deserts, sea beaches, rivers, mountains, sky with and without clouds, wind and rain, sun, moon and stars, rainy day, starry night, and sunny day, based on its line, form, colours, composition and perspective. ➤ Conducting classroom discussions on quality of visual art elements in selected work of art. ➤ Conducting /Organizing guided tour /s to the museum/s and art galleries. ➤ Providing a well -designed worksheet on museum and galleries to facilitate appreciation of any one section. For example,' 'Indian Miniatures', 'Sculptures of Gupta period' etc. ➤ Organising Visual thinking sessions on paintings, photographs, pottery, ceramics, terracotta, sculpture, installations, etc. of professional artists. <p>Integration with other Subjects:</p> <p>Languages:</p> <ul style="list-style-type: none"> ➤ Assisting children in illustrating at least one story from their language course. ➤ Organising exhibitions of illustrated stories of the class. 	<p>or video clip on 'Elements of Visual Arts'.</p> <ul style="list-style-type: none"> ➤ Children's scrap book. ➤ Collection and display of age appropriate art tools and materials in the class. ➤ Display boards with theme based display of children work and/or artist work. ➤ Computers with relevant soft wares and LCD projector for ICT based art experiences. ➤ Cameras. ➤ Exhibition Hall.

Life Skills: Learning based on this theme will help in sharpening the skills of observation, critical thinking and art appreciation. It will also increase children's participation in cleaning and beautification of classroom, school home and their environment.

Theme 8: Perspective

The theme "Perspective is aimed at children knowing, understanding and appreciating the beauty of the 3rd dimension in any object, architecture, or in a scene etc. Perspective, in the context of visual perception, is the way in which objects appear to our eyes based on their spatial dimensions, and position of our eye in relation to that object. The process of understanding and application of the perspective in visual arts will enhance the skills of; observation, imagination, critical analysis, artistic skills and creative expression. The prime focus of this theme is to make children aware of beauty and value of the 3rd dimension of any object in visual expressions. The process of applying perspective in visual arts will sensitize their eye on the play of light and shade, ratio and proportion, colour variation, use of lines in creating life like similarities in the objects. The application of perspective will also help in developing amongst children the skill of creating required distance between foreground and background on a flat (2-D) surface.

Learning Outcomes:

Children will be able to:

- state the role of perspective in landscape compositions;
- describe the play of light and shade on the given composition;
- differentiate between 'Linear' and 'Areal' perspective;
- create landscape/seascape using age appropriate perspective skills;
- respond to the perspective in art work done by themselves and their classmates;
- respond to the perspective in 2-D and 3-D artefacts displayed in galleries and museums, such as; paintings, pottery, terracotta and sculptures, installations, local crafts, etc. done by professional artists and artisans;
- demonstrate use of extended vocabulary related to perspective.

Perspective

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ State the role of perspective in landscape compositions. ➤ Describe the play of light and shade on the given composition. ➤ Differentiate between 'Linear' and 'Areal' perspective. ➤ Create landscape/ seascape using age appropriate perspective skills. ➤ Respond to the perspective skills applied in the art work done by their classmates and 	<ul style="list-style-type: none"> ➤ Encouraging and providing opportunities for children to explore and experience the play of light and shade on natural and artificial objects, building architecture, bridges and other structures, scenes etc. in their immediate surroundings. ➤ Organising classroom discussions on what is perspective and its relationship with the 3rd dimension of any object. ➤ Explaining Linear and Areal perspective, based on live examples. ➤ Conducting activities related to sketching and painting landscape/ seascape of their liking, while using age appropriate perspective skills. 	<ul style="list-style-type: none"> ➤ Children's own understanding of perspective, light and shade, 2-D and 3-D art work, based on their sketch books. ➤ Art work of every child in the class. ➤ Actual samples or even replicas of artist's work on perspective, both; linear and areal, on 2-D and 3-D work, videos of artists' work etc. ➤ Children's scrap book. ➤ Easels /stands.

Perspective

Key Concepts	Suggested Transactional Process	Suggested Learning Resources
<p>himself/herself.</p> <ul style="list-style-type: none"> ➤ Observations on perspective used in artefacts displayed in galleries and museums, such as; paintings of different periods or of different artists, pottery, terracotta and sculptures, installations, local crafts, etc. done by professional artists and artisans. ➤ Demonstrate use of extended vocabulary related to the theme. 	<ul style="list-style-type: none"> ➤ Providing opportunities for children to describe self-work and work done by the peers using perspective skills. ➤ Conducting practice sessions on Still life drawing to practice 3-D effects on a 2-D surface. A group of 3-4 objects such as; book, glass bottle/jug, a fruit and drapery can be organised on a table with proper lighting from one angle to practice the light and shade, ratio & proportion, reflection etc. ➤ Conducting/organising guided tour/s to view natural and artificial objects, architectural sites in the immediate surroundings. ➤ Conducting/organising guided tour/s to the museum/s and art galleries. ➤ Worksheet/s on use of perspective and its description in the work of masters, while visiting art gallery or a museum/s. 	<ul style="list-style-type: none"> ➤ Computer with LCD projector /ICT facilities. ➤ Cameras. ➤ Display boards with theme based display of children work and/or artist work.

Life Skills: Learning based on this theme will help in sharpening the skills of observation, imagination, critical thinking and that of artistic expression. It will also lead to an increase in the interest of creating life like art work and the ability to appreciate such work done by others.