

# Grade VIII

## മലയാളം

### പഠനനേട്ടങ്ങൾ

- വ്യത്യസ്ത കാലഘട്ടങ്ങളിലെ സാഹിത്യകൃതികൾ ആസ്വദിക്കുകയും ഭാഷ ജീവിതം എന്നിവ ഉചിതമായ വ്യവഹാരരൂപങ്ങൾ ആവിഷ്കരിക്കുകയും ചെയ്യുന്നു.
- ഗദ്യ ഭാഷയിലെ കാവ്യാത്മക തിരിച്ചറിയുന്നു. സ്വന്തം രചനകളിൽ ഔചിത്യപൂർവ്വം പ്രയോജനപ്പെടുത്തുന്നു
- അർത്ഥ ബോധം, ശബ്ദ ക്രമീകരണം എന്നിവ ഉൾക്കൊണ്ട് ഗദ്യ ഭാഗം വായിച്ച് അവതരിപ്പിക്കുന്നു
- ഗദ്യ ഭാഷയുടെ കാവ്യാത്മക തിരിച്ചറിയുകയും പ്രയോഗങ്ങൾ ഔചിത്യപൂർവ്വം രചനകളിൽ പ്രയോഗിക്കുകയും ചെയ്യുന്നു.
- നോവലുകളിലെ പ്രമേയം, ഭാഷ, ആഖ്യാനരീതി, കഥാപാത്രങ്ങളുടെ സവിശേഷതകൾ എന്നിവയെക്കുറിച്ച് ധാരണ രൂപപ്പെടുത്തുകയും ലഘു നിരൂപണങ്ങൾ തയ്യാറാക്കുകയും ചെയ്യുന്നു
- പുരാണേതിഹാസങ്ങളിൽ നിന്നും ഐതിഹ്യങ്ങളിൽ നിന്നും ഇതിവൃത്തം സ്വീകരിച്ച രചനകൾ പരിചയപ്പെടുകയും കഥാപാത്ര സൃഷ്ടി വിലയിരുത്തി അവതരിപ്പിക്കുകയും ചെയ്യുന്നു
- പദങ്ങൾ കൂടിച്ചേരുമ്പോൾ ഭാഷയ്ക്ക് ഉണ്ടാകുന്ന സാക്ഷിപ്ത സൗന്ദര്യവും തിരിച്ചറിഞ്ഞ് അവ മാറ്റിയെഴുതുന്ന പുസ്തകങ്ങൾ ആനുകാലിക പ്രസിദ്ധീകരണങ്ങൾ തുടങ്ങിയവ വായിച്ച് ആശയങ്ങൾ സ്വാംശീകരിച്ച് ലേഖനം തയ്യാറാക്കുന്നു
- പദങ്ങൾ പ്രയോഗങ്ങൾ ശൈലികൾ തുടങ്ങിയവ സന്ദർഭാനുസരണം രചനകൾ ഉൾപ്പെടുത്തുന്നു
- കഥ/ കവിതയിലെ ആശയം അലങ്കാര ഭംഗി,മുഹൂർത്തങ്ങൾ, വാക്യ ചിത്രങ്ങൾ എന്നിവ വിശകലനം ചെയ്ത് ആസ്വാദനം തയ്യാറാക്കുന്നു.
- പാഠഭാഗം വിശകലനം ചെയ്ത് ചർച്ചകളിലും മറ്റും സ്വാഭി പ്രായം പ്രകടിപ്പിക്കുന്നു.
- ആശയവും ഭാവവും ഉൾക്കൊണ്ട് ഒഴുക്കോടെ വായിച്ചു അവതരിപ്പിക്കുന്നു
- കേരളത്തിലെ കലകളെ ആസ്പദമാക്കിയുള്ള സെമിനാറുകൾ സംഘടിപ്പിക്കുകയും ആശയങ്ങളും നിലപാടുകളും യുക്തിപൂർവ്വം അവതരിപ്പിക്കുകയും ചെയ്യുന്നു
- ജീവിതത്തിന്റെ വൈവിധ്യങ്ങൾ പ്രതിപാദിക്കുന്ന കഥകൾ, കവിതകൾ എന്നിവ വായിച്ച് ആസ്വദിച്ചു സർഗാത്മകമായ രചനകളിൽ ഏർപ്പെടുന്നു
- ശേഖരിച്ച കഥകൾ ഉചിതമായ ഭാവം ശബ്ദവിന്യാസം എന്നിവ പാലിച്ച് അരങ്ങുകളിൽ അവതരിപ്പിക്കുന്നു.

- പാഠഭാഗത്തുള്ള ശൈലികൾ പ്രയോഗങ്ങൾ എന്നിവ കണ്ടെത്തി അവയുടെ സൗന്ദര്യതലം ഉൾക്കൊണ്ട് പഠനവും എഴുതിയും പ്രകടിപ്പിക്കുന്നു

# Grade VIII

## ENGLISH

### 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:

1. 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.
2. Listen to a talk /presentation /lecture and prepares notes;
3. Prepare and participate in class/ school-level discussions (having read/ researched material that is being studied);
4. Engage effectively in a range of collaborative discussions (group/ teacher-led) on class level texts, topics and issues;
5. Build on others' ideas and express their own views clearly;
6. make a planned oral presentation to a specific audience for an intended purpose;
7. Integrate multimedia and visual displays into presentations.

### 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:

1. Identify the central theme of a given text and trace its development;
2. Use text to support argument and point of view about character and plot;
3. Interpret how particular lines of dialogue/ incidents in a story or drama propel the action or reveal aspects of character;
4. Analyze/ how differences in the points of view of the characters and the audience or reader create such effects as suspense or humor;
5. Evaluate the extent to which a filmed/ live production of a story or drama stays faithful to/ departs from the text;

6. 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;
7. 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

## 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:

1. Develop different styles of writing as per the genre/ form with a sense of audience;
2. Relate and connect ideas/ concepts; selects appropriate introductory strategies, develop logical arguments, gives examples and use appropriate quotations to support arguments;
3. Connect relevant ideas and formulates appropriate conclusions;
4. Focus on the use of grade appropriate vocabulary, using precise phrases, sensory language to make the writing vivid and vibrant;
5. Work on short projects individually and in groups for collaborative work and help foster greater
6. Interaction among students;
7. Develop age appropriate skills of writing across disciplines;
8. Use technology as a resource to enhance research work;
9. Draw from personal experience or real life situations;
10. Take a stand / debate on argumentative topics and logically defend his/her point of view;
11. Demonstrate the ability to use words and phrases to the grade appropriate level, including those that convey emotions, actions, etc.

### Creative writing

1. Write narratives that recount a well-elaborated event or short sequence of events; includes
2. Details to describe actions, thoughts, and feelings;
3. Write creative pieces such as story, poems, travelogs, features, etc.;
4. Prepare advertisements/posters/ notices etc. on various topics;
5. Write formal/informal letters using the prescribed format;
6. Write four or more paragraphs of about 250 - 300 words at a more advanced level on any given topic;
7. 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.

## **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:**

- **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 form print and digital sources

# Grade VIII

## Hindi

### कक्षा VIII

#### 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 (ग्राफिक्स, 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।

### **थीम 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 संवर्द्धन 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।

### **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 उपलब्धियां (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।



# Grade VIII

## MATHEMATICS

### Theme 01: 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:

1. Describe properties of rational numbers and express them in general form;
2. Consolidate operations on rational numbers;
3. Represent rational numbers on the number line;
4. 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.);
5. Generalize and verify properties of rational numbers. (including identities);
6. Use general form of expression to describe properties of operations on rational numbers like closer, commutative, associative, existence of identity and existence of inverse;
7. Do word problem (higher logic, two operations, including ideas like area);
8. Write repeated multiplication and division using integers as exponents;
9. Describe and verify laws of exponents with integral powers;
10. Find squares, square roots, cubes, cube roots of number;
11. Find square and square roots;
12. Undertake calculating square roots using the factor and division method for numbers containing;
13. No more than 4 digits and
14. No more than 2 decimal places
15. Find cubes and cube roots;
16. Estimate square roots and cube roots.
17. Learn the process of moving nearer to the required number;

18. 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.);
19. Construct and solve problems and puzzles;
20. Solve number puzzles and games;
21. Deduce the divisibility test rules of 2, 3, 5, 9, 10 for a two or three-digit number expressed in the general form;
22. Find union and intersection of sets;
23. Define disjoint sets;
24. Find the complement of a set.

## Theme 02: 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:

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

## Theme 03: 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:

1. Multiply and divide algebraic expressions (integral coefficient only);
2. Focus on some common errors like  $2 + x \neq 2x$ ,  $7x + y \neq 7xy$  etc.;
3. Prove and use identities  $(a \pm b)^2 = a^2 \pm 2ab + b^2$ ,  $a^2 - b^2 = (a - b)(a + b)$   
 $(a \pm b)^2 = a^2 \pm 2ab + b^2$ ;
4. Factorize algebraic expressions (simple cases only) as examples the following types  $a(x + y)$ ,  $(x \pm y)^2$ ,  $a^2 - b^2$ ,  $(x + a)(x + b)$  ;
5. Solve linear equations in one variable in contextual problems involving multiplication and division (simple rational coefficient in the equations);
6. Multiply two algebraic expressions and forms algebraic identities for square of binomials;
7. Factorize an algebraic expression using identities;
8. Find a solution to inequalities in one variable using properties of inequalities.

## **Theme 04: 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:

1. Explore and verify properties of quadrilaterals like sum of angles of a quadrilateral is equal to  $360^\circ$  (by verification);
2. Explore and verify properties of parallelogram (by verification) like

1. Opposite sides of a parallelogram are equal,
  2. Opposite angles of a parallelogram are equal,
  3. Diagonals of a parallelogram bisect each other.
  4. Diagonals of a rectangle are equal and bisect each other
  5. Diagonals of a rhombus bisect each other at right angles.
  6. Diagonals of a square are equal and bisect each other at right angles.
2. Identify and match pictures with objects [more complicated e.G. Nested, joint 2-d and 3-d shapes (not more than 2)];
  3. Draw 2-d representation of 3-d objects (continued and extended);
  4. Count number of vertices, edges & faces & verifying euler's relation for 3-d figures with flat faces (cubes, cuboids, tetrahedrons, prisms and pyramids);
  5. Generalize the sum of angles of quadrilateral and use it in solving various problems related to finding angles of a quadrilateral;
  6. Explain properties of parallelograms and tries to reason out how one property is related to other;
  7. Represent 3-d shapes on a plane surface like paper, board, wall etc.;
  8. Make nets of prisms and pyramids and forms the shapes from the nets;
  9. Construct quadrilaterals using pair of compasses and straight edge given:
    - a. Four sides and one diagonal
  1. Three sides and two diagonals
    - a. Three sides and two included angles
    - b. Two adjacent sides and three angles
  1. Construct quadrilaterals given:
    - a. Four sides and one diagonal
    - b. Three sides and two diagonals
    - c. Three sides and two included angles
    - d. Two adjacent sides and three angles.
  1. 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.);
  2. Read linear graphs;
  3. Distinguish the shapes that are symmetrical and find line of symmetry by paper folding;
  4. Define and identify various parts of a circle.

## **Theme 05: 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:

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

## **Theme 06: 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:

1. Arrange ungrouped data into groups and represent grouped data through bar-graphs;
2. Construct and interpret bar-graphs;
3. Interpret simple pie charts with reasonable data numbers;

4. Consolidate and generalize the notion of chance in events like tossing coins, dice etc. And relating it to chance in life events;
5. Throw a large number of identical dice/coins together and aggregate the result of the throws to get a large number of individual events. Observing the aggregating numbers over a large number of repeated events;
6. Make a hypothesis on chances of coming events on the basis of its earlier occurrences like after repeated throws of dice and coins;

# Grade VIII

## HISTORY

### Theme 01: 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:

1. Create a general idea of events and changes that occurred all over the world during the period of study;
2. Identify the basic differences between primary and secondary sources;
3. Recognize, understand and reflect on the important movements such as renaissance, reformation;
4. Analyze the radical changes brought about by the industrial revolution;
5. Evaluate the impact of imperialism on the world.

### Theme 02: 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:

1. Identify the earliest Nationalist movements in history;
2. Examine major changes that occurred in the world due to the French revolution and the American War of Independence;
3. Analyze various factors leading to the French revolution;
4. Trace the history of the American War of Independence;
5. Identify the reasons for the Civil war;
6. Analyze the role played by Abraham Lincoln;
7. Evaluate and assess the impact of the civil war

## Theme 03: 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:

1. Identify the Mughal rulers who ruled after Aurangzeb (later Mughals);
2. Discuss factors responsible for the decline of the Mughal empire;
3. Examine the rise of regional kingdoms;
4. Recognize the rising power of the Marathas under the Peshwas.

## Theme 04: 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:

1. Understand and discuss the system of trade and commerce in India in the 17th and 18th centuries;
2. Identify the intense rivalry among the trading companies;
3. Discuss the impact of the Battle of Plassey and Buxar in strengthening the British position in India;
4. Understand the expansionist policy of the British with reference to dual government, doctrine of lapse, subsidiary alliance and annexation of Avadh.

## Theme 05: 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:



1. Critically analyze and reflect on the economic policy of India under the Company;
2. Identify the different land revenue systems introduced by the British;
3. Discuss and examine the impacts of the British rule on the traditional industries;
4. Evaluate and analyze the educational policy of the British.

## **Theme 06: 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:

1. Analyze the reasons for the great uprising;
2. Trace and locate centres of the great uprising on an outline map of India;
3. Discuss the policy of lapse;
4. Examine the consequences of the great uprising of 1857.

## **Theme 07: 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:

1. Identify the socio-religious practices that existed in Indian society in the 19th century;
2. Discuss the importance of social reform movements during the 19th & 20th century raising awareness about prevalent social practices;
3. Explain the efforts of the reformers to deal with issues such as caste system, child marriage, sati, pratha, etc.;
4. Analyze the impact of the reform movement on the Indian society;
5. Appreciate the role of social reformers.

## **Theme 08: 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:

1. Define nationalism and identify factors giving rise to nationalism;
2. State the objectives of the Indian National Congress;
3. Discuss and comprehend the methods and demands of the moderates;
4. Appreciate the ideas of Nationalism and Swadeshi;
5. Identify the significance of the Home Rule Movement and the Lucknow Pact;
6. Discuss various campaigns initiated by Gandhi;
7. Explain the various factors responsible for the launching of Non-Cooperation and Civil Disobedience movement and Quit India movement;
8. Discuss the impact of the mass movements;
9. Analyze the objectives of Forward Bloc and the INA;
10. Examine the various clauses of the Indian Independence Act;
11. Appreciate and reflect on the sacrifices made by our national heroes.

# Grade VIII

## CIVICS

### Theme 01: 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:

1. Discuss the composition of the Indian parliament - the Lok Sabha and Rajya Sabha;
2. Compare and understand the working of the Lok Sabha and the Rajya Sabha;
3. Describe the relation between the two houses;
4. Explain the powers and the functions of the Union Parliament;
5. State the qualifications, elections, powers and functions of the President, Prime minister and Council of ministers;
6. 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;
7. Highlight the powers and functions of Judges of the supreme court and high courts;
8. Discuss the concept of judicial review and court of record;
9. Explain the term 'writ' giving examples.

### Theme 02: 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:

1. Understand and describe the aims and principles of the United Nations(U.N.);

2. Outline the organs of the U.N.;
3. Discuss the composition of the General Assembly, Security Council and the International Court of Justice;
4. Highlight the functions of the U.N. Agencies (UNESCO, UNICEF, WHO);
5. Appreciate the role and services provided by U.N. Agencies.

# Grade VIII

## GEOGRAPHY

### Theme 01: Representation of Geographical Features

Topographical sheets or toposheets 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:

1. Read contours on toposheets;
2. Distinguish between steep and gentle slopes through contours;
3. Identify landforms through contours on the toposheet;
4. Differentiate patterns of settlements on the toposheet;
5. Draw contours and related landforms on plain paper;
6. Interpret and analyze the toposheets.

### Theme 02: 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:

1. Describe the factors affecting the population of a place;
2. Identify over and under populated countries in the world;
3. Analyze the impact of over and under population on society;
4. Interpret a population pyramid showing composition of the population on the basis of age and sex.

### Theme 03: 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:

1. Differentiate the terms - immigration and emigration;
2. Explain reasons for migration from and to any area;
3. Analyze impact of migration on any area;
4. Identify regions of the world where huge migration took place during the historical period.
5. Explain the meaning of brain-drain;
6. Identify causes of brain drain in India;
7. Analyze the positive and negative impact of brain- drain in India.

## Theme 04: Urbanization

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:

1. Describe the term urbanization;
2. Identify causes of urbanization;
3. Describe impacts of urbanization;
4. Differentiate a smart city from any other urban center;
5. Explain strategies/ steps taken at the local level to keep the urban areas clean.
6. Discuss ways to reduce the negative impact of urbanization.

## Theme 05: 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:

1. Differentiate between natural and manmade disasters;
2. Discuss the importance of disaster management;

3. Demonstrate (through drills) measures to be taken in case of an earthquake, flood, fire;
4. Describe the causes, effects and impact of floods, earthquakes and oil spills on life and environment.
5. List measures to be taken to prevent disasters.

## **Theme 06: 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:

1. Identify countries of Asia on the globe and on the world map;
2. Locate physical features e.g. important mountains, plateaus, deserts, rivers, lakes, islands on the map of Asia;
3. Describe the impact of latitudinal extent and distinct relief features on the climate of Asia;
4. Analyze interrelationship between climate and natural vegetation found in the different regions of Asia.

## **Theme 07: 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:

1. Interpret location and extent of India with reference to other countries of Asia;
2. Locate important mountains, plateaus, deserts, islands, rivers on the map of India;
3. Compare the relief, climate and vegetation of India with other parts of Asia;
4. Discuss the importance of monsoon and its impact on the socio-cultural unity of India.

## **Theme 08: 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:

1. Discuss the meaning of human resource;
2. Describe the role of health and education in developing human resources;
3. Understand the meaning of skilled and unskilled human resource;
4. Identify areas in India lagging behind in development due to unavailability of unskilled human resource;
5. Analyze factors responsible for development of any area.



# Grade VIII

## PHYSICS

### Theme 01: 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:

1. Distinguish the three states of matter in terms of movement of particles;
2. Relate the three states of matter with energy of movement of particles in them;
3. Describe the change of state using Kinetic theory:
  1. Boiling
  2. Vaporization
  3. Melting
  4. Fusion
  5. Evaporation
  6. Condensation
  7. Sublimation
  8. Deposition
  9. Freezing
2. Identify appropriate observable parameters in experiments;
3. Collect data and make careful observation;
4. Present the results in the form of tables;
5. Consider results using scientific knowledge and communicate these.

### Theme 02: 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:

1. Measure density of an irregular solids;

2. Measure density of a liquid;
3. Discuss the concept of floatation based on relative densities of solid and liquid;
4. Express result of measurement in proper unit with proper symbol;
5. Solve simple numerical problems based on formula of density;
6. Compare densities of matter in three states, solid, liquid and gas;
7. Make careful observations including measurements;
8. Gather data using formal units;
9. Make conclusions from collected data;
10. Make predictions using scientific knowledge and effectively communicate the same.

### **Theme 03: 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:

1. Explain the turning effect of a force, with examples from daily life;
2. Define moment of force;
3. Express moment of force in proper units;
4. Solve simple numerical problems based on moment of force;
5. Define pressure;
6. Express pressure in proper units;
7. Solve simple numerical problems based on formula for pressure;
8. Describe pressure exerted by a liquid;
9. Demonstrate that liquids exert pressure;
10. Describe pressure exerted by a gas;
11. Describe atmospheric pressure;
12. Express thoughts that reveal originality, speculation, imagination, a personal perspective, flexibility in thinking, invention or creativity;
13. Present ideas clearly and in logical order

### **Theme 04: 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:

1. Define work;
2. Express work in proper unit;
3. Calculate work done in simple cases;
4. Define kinetic energy;
5. Express kinetic energy in proper units;
6. Solve simple problems based on kinetic energy;
7. Define potential energy;
8. Define gravitational potential energy;
9. Solve simple problems based on gravitational potential energy;
10. Describe energy transformation in daily life situation;
11. Distinguish between energy and power;
12. Can plan an experimental investigation or demonstration using Scientific processes;
13. Can identify /select on the basis of attributes.

## **Theme 05: 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:

1. Define refraction;
2. Discuss examples of refraction;
3. Describe a spherical mirror;
4. Describe a concave and a convex mirror;
5. Define the terms, principal axis, center and radius of curvature, focus and focal length for a spherical mirror;
6. Describe rules for making ray diagrams for spherical mirror;
7. Distinguish between real and virtual images;
8. Use a ray diagram to show formation of a real image by a spherical mirror;
9. Describe the characteristics of a real image formed by a spherical mirror;
10. Describe dispersion of white light by a prism into constituent colors;
11. Display a scientific attitude while making models;

12. Show a creative mind set while studying real world optical phenomena;
13. Communicate logical reasoning and explanations effectively using scientific terms.

## Theme 06: 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:

1. Compare and contrast Boiling and Evaporation;
2. Describe thermal expansion of matter;
3. Describe, linear, area(superficial) and volume expansion;
4. Compare expansivity in Solids, Liquids and Gasses;
5. Construct models based on scientific process;
6. Observe and cite multiple physical phenomena from one experiment

## Theme 07: 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:

1. Relate pitch and frequency;
2. Understand pitch and frequency in relation to working of musical instruments. (wind, membrane and string);
3. Explain mono tone;
4. Relate loudness and amplitude;
5. State the unit of loudness in decibels.

## Theme 08: 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:

1. Describe household consumption of electricity;
2. Identify live wire, neutral wire and earth wire in terms of their energy and path they travel;
3. Describe safety components (fuses, circuit breakers);
4. Describe phenomenon of static electricity;
5. Explain conservation of charges;
6. Describe conduction and induction of charges;
7. Describe construction and working of an electroscope;
8. Describe a lightning conductor;
9. Identify dangers of electricity;
10. Conduct scientific experiments keeping in mind all the parameters;
11. Study the impact of energy consumption and draw conclusions from the same and suggest alternate approaches;
12. Learn the use of safety precautions while dealing with electrical appliances.

# Grade VIII

## CHEMISTRY

### Theme 01: 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:

1. Describe the main postulates of the kinetic theory of matter;
2. 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;
3. Define and explain the law of conservation of mass using an example.

### Theme 02: Physical and Chemical Changes

This theme will enable children to understand that there are different types of changes in our surroundings which as 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:

1. Illustrate different changes occurring in nature with examples learned in previous classes;
2. Perform some activities to show some well-known changes;
3. Differentiate between physical and chemical changes and classify the changes.

### Theme 03: 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:

1. Recall previous knowledge related to elements, compounds and mixtures;
2. Classify substances into elements, compounds and mixtures on the basis of their properties;
3. Perform activities to separate components of a mixture;
4. Explain the principle involved in using a particular technique in separating a mixture.

## Theme 04: 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:

1. Describe that an atom consists of electrons, protons and neutrons;
2. Define atomic number and mass number;
3. Discuss valency of elements and radicals with respect to the number of hydrogen atoms combining with one atom of the element.

## Theme 05: 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:

1. Recall the symbols of different elements;
2. Derive the formulae of compounds on the basis of valencies of elements and radicals;
3. Write chemical equation of a reaction;
4. Balance chemical equations by applying the law of conservation of mass

## Theme 06: 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:

1. Describe different types of chemical reactions with examples;
2. Identify the type of chemical reaction;
3. Identify different oxides as basic, acidic, amphoteric and neutral;
4. Explain the effect of heat on oxides of some metals.

## **Theme 07: 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:

1. Describe the preparation of hydrogen from electrolysis of water;
2. Prepare hydrogen in the lab. using zinc and acid;
3. Describe properties and uses of hydrogen;
4. Correlate concepts of oxidation and reduction with addition and removal of oxygen or removal and addition of hydrogen.

## **Theme 08: 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:

1. Describe that water dissolves many substances and it is a universal solvent;
2. Identify a solution, suspension and colloid on the basis of properties;
3. State the differences between saturated, unsaturated and supersaturated solutions;
4. Describe water of crystallization;
5. Write equations of metals with cold water and steam;
6. Describe hard and soft water;
7. Discuss the different methods of softening of water.



## Theme 09: 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:

1. Explain the term allotropy;
2. Describe different Allotropes of Carbon;
3. State the properties of Graphite and Diamond;
4. Prepare carbon dioxide in a laboratory;
5. Describe the uses of carbon dioxide;
6. Demonstrate different reactions of carbon dioxide with lime water and litmus solutions

# Grade VIII

## BIOLOGY

### Theme 01: 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:

1. Learn about the existence of a transport system inside the plant body of complex multicellular
2. Higher plants;
3. Explain that transport in unicellular and simple multicellular plants takes place by diffusion;
4. Define and discuss diffusion, osmosis, transpiration, root pressure;
5. Perform experiments and demonstrate the process of osmosis;
6. Realize that the minerals required are either micronutrients or macronutrients depending upon the quantity required by the plants;
7. Relate that the deficiency or lack of essential nutrients leads to specific symptoms and diseases.
8. Define transpiration, interpret its role in xylem transport and know about the factors affecting rate of transpiration.
9. Demonstrate transpiration through simple experiments.

### Theme 02: 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:

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

### **Theme 03: 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:

1. Define the terms ecosystem, producer, consumer, decomposer, food chain, food web and pyramid of numbers, with examples (technical terms);
2. Explain and analyze the biotic and abiotic components of an ecosystem;
3. Interpret the relationship between different biotic components in terms of food chain, food web and pyramid of numbers;
4. Evaluate the abiotic factors and their influence on biotic factors;
5. Describe and provide examples for interdependence relationships between organisms (symbiosis, parasitism and predation);
6. Draw relationship between the flora and fauna of a particular forest ecosystem;
7. Make a flow chart of a food chain and food web.

## Theme 04: 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:

1. Explain that in addition to nervous control, another control/coordination mechanism called hormonal control also exists in humans;
2. Define the terms – endocrine system, hormones, endocrine and exocrine glands;
3. 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;
4. Relate the knowledge gained and explain the changes in their own bodies;
5. Become aware about the changes that occur during adolescence and how to manage the emotional and physical changes;
6. Explain the techniques used in the management of stress;
7. Draw diagrams of the heart, circulatory system, neuron and reflex action;
8. List out the functions of the heart, nervous system, lymph, RBC and WBC.

## Theme 05: 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:

1. Identify some communicable diseases, their causative agents and symptoms;
2. Show concern towards maintaining personal hygiene and cleanliness of the surroundings;
3. List some common vector borne diseases;
4. Differentiate between vaccination and immunization;
5. List the harmful effects of consumption of tobacco, drinking alcohol and taking habit forming drugs;
6. Use some simple first aid methods in day to day emergency situations.

## Theme 06: 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:

1. Discuss uses of bacteria in the food industry;
2. List importance of mushroom and yeast in the food industry;
3. Explain the meaning of agriculture, horticulture, pisciculture (fish farming), apiculture, sericulture, green revolution, white revolution and animal husbandry;
4. 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;
5. List common names of (i) useful plants and animals, (ii) ornamental plants/decorative flowers;
6. List the milk-yielding (milch) animals, meat and egg-laying animals, draught animals and poultry

## COMPUTER STUDIES - CLASS 08

### Topic 01: 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:

1. Differentiate between CUI and GUI in terms of multitasking;
2. List the features, functions and advantages of GUI

### Chapter 01

### Topic 02: 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:

1. Edit and format a worksheet;
2. Define cell range and apply formula;
3. Differentiate between different cell referencing;
4. Edit a sheet from sheet tab;
5. Formulate a function and create a chart.

Not included in the current textbook.

### Topic 03: 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:

1. Describe an algorithm;
2. List characteristics of algorithm;
3. Analyze a problem;
4. Apply algorithm to find the best solution of a given problem;
5. Describe flowchart with its symbols;
6. Design a flowchart.

## Chapter 06

### Topic 04: 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:

1. Explain the need of programming;
2. Define the basic components of a program;
3. Explain the need of different data types;
4. Use correct syntax of components to write an error free program;
5. Compile and execute a program;
6. Use different operators.
7. Identify the flow of control in selection statements.
8. Design a program with appropriate selection statements

## Chapter 07

### Topic 05: 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:

1. Identify different types of apps;
2. List uses of apps;
3. Classify apps;
4. Design and develop an app.

## Chapter 08

### Topic 06: 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:

1. Define a network and its components,
2. Differentiate between types of network.
3. Explain the ways in which data moves over the network.
4. Explain Internet terms.
5. Discuss the need of protocols in networking.
6. Summarize the characteristics and advantages of cloud computing.
7. Use cloud computing to store, share and present data/ information

## Chapter 01

- 1.