

1. Listens attentively and critically to classroom discussions, announcements, speeches, lectures, interviews, and audio-visual presentations
2. Communicates confidently and effectively in formal and informal situations by expressing ideas, opinions, arguments, emotions, and experiences with clarity, fluency, accuracy, and appropriate pronunciation, stress, intonation, and body language.
3. Participates actively in group discussions, debates, role plays, interviews, storytelling, and collaborative learning tasks by presenting well-reasoned arguments and respecting diverse perspectives.
4. Recites and interprets poetry with appropriate expression, rhythm, pace, pronunciation, stress, pause, and intonation, demonstrating appreciation of poetic language, imagery, emotions, and literary beauty.
5. Reads fluently and independently a wide range of literary and informational texts, including fiction, non-fiction, biographies, autobiographies, essays, speeches, articles, reports, editorials, advertisements, and digital texts, selecting suitable reading strategies according to purpose.
6. Demonstrates deep comprehension by identifying the central idea, theme, author's purpose, sequence of events, plot development, setting, characterisation, conflict, resolution, and supporting details in literary and informational texts.
7. Analyses characters, events, themes, and relationships by interpreting their motives, actions, emotions, values, and contributions to the overall meaning of the text, supporting responses with textual evidence.
8. Interprets information presented through multiple modes, including tables, graphs, charts, maps, diagrams, advertisements, posters, cartoons, and photographs, integrating visual and textual information meaningfully.
9. Uses contextual clues, word formation strategies, and dictionaries to determine the meanings of unfamiliar words, enrich vocabulary, and improve reading comprehension.
10. Appreciates literary texts by identifying and analysing literary devices such as imagery, symbolism, metaphor, simile, personification, alliteration, irony, rhyme scheme, rhythm, repetition, explaining their contribution to meaning and aesthetic effect.
11. Applies grammatical knowledge accurately and appropriately by using different sentence structures, tenses, modals, reported speech, active and passive voice, clauses, phrases, determiners, conjunctions, and punctuation.
12. Writes organised and well-developed compositions on familiar and unfamiliar topics, presenting ideas logically with appropriate introductions, supporting evidence, transitions, and conclusions while maintaining unity and coherence.

13. Engages in creative writing by composing stories, dialogues, scripts, poems, character sketches, reviews, reflective pieces, and imaginative compositions using original ideas, effective vocabulary, descriptive language, and appropriate literary techniques.
14. Edits, revises, and proofreads written work independently by identifying and correcting errors related to grammar, spelling, punctuation, vocabulary, sentence construction, coherence, organisation, and style to enhance the quality of writing.
15. Demonstrates critical thinking and problem-solving skills by analysing issues, evaluating arguments, comparing viewpoints, drawing reasoned conclusions, and supporting opinions with relevant evidence.
16. Collaborates effectively with peers in pair and group activities by sharing ideas, accepting feedback, resolving differences respectfully, and contributing responsibly towards common goals.
17. Demonstrates sensitivity towards cultural diversity, gender equality, environmental sustainability, constitutional values, and social responsibility through thoughtful engagement with literary and informational texts.
18. Uses English confidently in real-life situations by adapting language according to audience, context, and purpose while maintaining accuracy and appropriateness.
19. Cultivates lifelong reading habits, intellectual curiosity, creativity, empathy, and appreciation for literature, recognising language as a powerful means of personal growth, effective communication, and responsible citizenship.

कक्षा 9 हिंदी ('गंगा') - मुख्य सीखने के प्रतिफल

1. श्रवण और मौखिक अभिव्यक्ति (Listening & Speaking)

- **सक्रिय श्रवण (Active Listening):** विद्यार्थी दृश्य-श्रव्य माध्यमों (रेडियो, टीवी, पॉडकास्ट) और सामाजिक बहसों को धैर्यपूर्वक सुनकर मुख्य संदेश को ग्रहण कर सकेंगे।
- **तार्किक विमर्श:** जेंडर संवेदनशीलता, पर्यावरण और सामाजिक असमानता जैसे संवेदनशील विषयों पर बिना किसी हिचकिचाहट के अपनी तार्किक राय मौखिक रूप से व्यक्त कर सकेंगे।
- **रचनात्मक प्रस्तुति:** रोल-प्ले (Role-play), कविता पाठ और नाट्य-संवादों के माध्यम से भाषा के उतार-चढ़ाव (Intonation) को समझकर प्रभावी प्रस्तुति दे सकेंगे।

2. पठन और आलोचनात्मक विश्लेषण (Reading & Critical Thinking)

- **केंद्रीय भाव की समझ:** पठित और अपठित गद्य-पद्य को पढ़कर उनके अंतर्निहित संदेश, लेखक के दृष्टिकोण और मुख्य विषय (Theme) का आलोचनात्मक विश्लेषण कर सकेंगे।
- **विधागत अंतरसंबंध:** साहित्य की विभिन्न विधाओं (जैसे कहानी, निबंध, संस्मरण, रेखाचित्र) के बदलते स्वरूप और उनकी लेखन शैलियों में अंतर को पहचान सकेंगे।

3. स्वतंत्र एवं रचनात्मक लेखन (Written Expression)

- **मौलिक लेखन:** रटने की प्रवृत्ति से दूर, अपने व्यक्तिगत अनुभवों और कल्पनाओं के आधार पर स्वतंत्र व मौलिक भाषा गढ़ते हुए निबंध या विचार लिख सकेंगे।
- **व्यावहारिक विधाएँ:** दिए गए संकेत-बिंदुओं के आधार पर समसामयिक विषयों पर अनुच्छेद, औपचारिक/अनौपचारिक पत्र और प्रभावी संवाद लेखन कर सकेंगे।
- **कल्पनाशीलता का विस्तार:** किसी अधूरी कहानी या कविता को अपनी कल्पना से एक तार्किक और रोचक अंत दे सकेंगे।

4. संदर्भगत व्यावहारिक व्याकरण (Applied Grammar)

- **व्यावहारिक अनुप्रयोग:** व्याकरण के नियमों को रटने के स्थान पर संदर्भ के अनुसार उनका सही उपयोग (जैसे- वाक्य शुद्धि, विराम चिह्न) कर सकेंगे।
- **शब्द संपदा का विस्तार:** उपसर्ग, प्रत्यय, समानार्थी शब्द, मुहावरे और विभिन्न पदबंधों (संज्ञा, सर्वनाम, विशेषण, क्रिया, निपात) को पहचानकर अपने लेखन को समृद्ध कर सकेंगे।

5. बहुभाषिकता और परिवेशीय चेतना (Multilingualism & Cultural Awareness)

- **भाषा संगम:** हिंदी के साथ-साथ अन्य भारतीय भाषाओं (Bhartiya Bhashas) के शब्दों और उनके अंतर्संबंधों के प्रति सम्मान व जिज्ञासा का भाव प्रदर्शित कर सकेंगे।
- **सांस्कृतिक जुड़ाव:** लोक-कलाओं, कृषि, हस्तशिल्प और स्थानीय परिवेश से जुड़ी शब्दावली को समझकर अपनी सांस्कृतिक धरोहर के प्रति संवेदनशील बन सकेंगे।

1. ಕನ್ನಡ ಭಾಷೆಯನ್ನು ಸ್ಪಷ್ಟವಾಗಿ ಕೇಳಿ ಅರ್ಥೈಸುತ್ತಾರೆ.
2. ಶುದ್ಧ ಉಚ್ಚಾರಣೆಯೊಂದಿಗೆ ಓದುತ್ತಾರೆ.
3. ಗದ್ಯ ಹಾಗೂ ಪದ್ಯದ ಮುಖ್ಯ ಆಶಯವನ್ನು ಗ್ರಹಿಸುತ್ತಾರೆ.
4. ಪಾಠದ ಮುಖ್ಯ ಅಂಶಗಳನ್ನು ತಮ್ಮದೇ ಮಾತುಗಳಲ್ಲಿ ವಿವರಿಸುತ್ತಾರೆ.
5. ಲೇಖಕರ ಹಾಗೂ ಕವಿಗಳ ಪರಿಚಯವನ್ನು ತಿಳಿದುಕೊಳ್ಳುತ್ತಾರೆ.
6. ಹೊಸ ಪದಗಳ ಅರ್ಥವನ್ನು ಸಂದರ್ಭಾನುಸಾರ ತಿಳಿದು ಬಳಸುತ್ತಾರೆ.
7. ಪದಸಂಪತ್ತಿಯನ್ನು ವೃದ್ಧಿಸಿಕೊಳ್ಳುತ್ತಾರೆ.
8. ವ್ಯಾಕರಣದ ನಿಯಮಗಳನ್ನು ಸರಿಯಾಗಿ ಅನ್ವಯಿಸುತ್ತಾರೆ.
9. ನಾಮಪದ, ಸರ್ವನಾಮ, ಕ್ರಿಯಾಪದಗಳನ್ನು ಗುರುತಿಸುತ್ತಾರೆ.
10. ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯಗಳನ್ನು ಸರಿಯಾಗಿ ಬಳಸುತ್ತಾರೆ.
- 11 ಸಂಧಿ ಮತ್ತು ಸಮಾಸಗಳನ್ನು ಗುರುತಿಸಿ ಬಳಸುತ್ತಾರೆ.
12. ವಿರಾಮಚಿಹ್ನೆಗಳನ್ನು ಸರಿಯಾಗಿ ಬಳಸುತ್ತಾರೆ.
- 13.ವಾಕ್ಯರಚನೆ ಕೌಶಲವನ್ನು ಬೆಳೆಸಿಕೊಳ್ಳುತ್ತಾರೆ.
14. ಶುದ್ಧ ಕನ್ನಡದಲ್ಲಿ ಮಾತನಾಡುವ ಕೌಶಲವನ್ನು ಬೆಳೆಸಿಕೊಳ್ಳುತ್ತಾರೆ.
15. ಶುದ್ಧವಾಗಿ ಬರೆಯುವ ಕೌಶಲವನ್ನು ಅಭಿವೃದ್ಧಿಪಡಿಸುತ್ತಾರೆ.
16. ಅಪರಿತ ಗದ್ಯಭಾಗವನ್ನು ಓದಿ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸುತ್ತಾರೆ.
17. ಸಾರಾಂಶ ಬರೆಯಲು ಕಲಿಯುತ್ತಾರೆ.
18. ಪತ್ರಲೇಖನವನ್ನು ಸರಿಯಾದ ವಿನ್ಯಾಸದಲ್ಲಿ ಬರೆಯುತ್ತಾರೆ.
19. ಪ್ರಬಂಧ ಬರೆಯುವ ಕೌಶಲವನ್ನು ಬೆಳೆಸಿಕೊಳ್ಳುತ್ತಾರೆ.
20. ವರದಿ ಬರೆಯಲು ಸಮರ್ಥರಾಗುತ್ತಾರೆ.
- 21 ಸಂಭಾಷಣೆ ರಚಿಸುತ್ತಾರೆ.

- 22 ಜಾಹೀರಾತು ರಚಿಸುವ ಕೌಶಲವನ್ನು ಪಡೆಯುತ್ತಾರೆ.
- 23 ಸೂಚನೆಗಳು ಹಾಗೂ ಪ್ರಕಟಣೆಗಳನ್ನು ಬರೆಯುತ್ತಾರೆ.
- 24.ಕಥೆಯನ್ನು ವಿಸ್ತರಿಸಿ ಬರೆಯುತ್ತಾರೆ.
- 25.ಚಿತ್ರವನ್ನು ಅಧರಿಸಿ ಬರವಣಿಗೆ ಮಾಡುತ್ತಾರೆ.
- 26.ಪದ್ಯಗಳಲ್ಲಿರುವ ಅಲಂಕಾರ ಹಾಗೂ ಭಾವವನ್ನು ಗುರುತಿಸುತ್ತಾರೆ.
27. ಸಾಹಿತ್ಯದ ಮೂಲಕ ಮಾನವೀಯ ಮೌಲ್ಯಗಳನ್ನು ಅಳವಡಿಸಿಕೊಳ್ಳುತ್ತಾರೆ.
28. ಪರಿಸರ ಸಂರಕ್ಷಣೆಯ ಮಹತ್ವವನ್ನು ಅರಿಯುತ್ತಾರೆ.
- 29.ರಾಷ್ಟ್ರೀಯ ಏಕತೆ ಹಾಗೂ ದೇಶಭಕ್ತಿಯ ಮನೋಭಾವವನ್ನು ಬೆಳೆಸಿಕೊಳ್ಳುತ್ತಾರೆ.
- 30.ಸಾಮಾಜಿಕ ಜವಾಬ್ದಾರಿಯನ್ನು ಅರ್ಥಮಾಡಿಕೊಳ್ಳುತ್ತಾರೆ.
31. ವೈಜ್ಞಾನಿಕ ಮನೋಭಾವವನ್ನು ಬೆಳೆಸಿಕೊಳ್ಳುತ್ತಾರೆ.
- 32 ಸೃಜನಾತ್ಮಕ ಚಿಂತನೆ ಮತ್ತು ಅಭಿವ್ಯಕ್ತಿ ಕೌಶಲವನ್ನು ಅಭಿವೃದ್ಧಿಪಡಿಸುತ್ತಾರೆ.
- 33 ಗುಂಪುಚರ್ಚೆಯಲ್ಲಿ ಸಕ್ರಿಯವಾಗಿ ಭಾಗವಹಿಸುತ್ತಾರೆ.
34. ಆತ್ಮವಿಶ್ವಾಸದಿಂದ ಅಭಿಪ್ರಾಯಗಳನ್ನು ವ್ಯಕ್ತಪಡಿಸುತ್ತಾರೆ.
- 35.ಭಾಷೆಯ ಸೌಂದರ್ಯ ಮತ್ತು ಸಾಹಿತ್ಯಾಸಕ್ತಿಯನ್ನು ಬೆಳೆಸಿಕೊಳ್ಳುತ್ತಾರೆ.
- 36.ಕನ್ನಡ ಭಾಷೆ ಮತ್ತು ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಗೌರವವನ್ನು ಬೆಳೆಸಿಕೊಳ್ಳುತ್ತಾರೆ.
- 37.ಮಾಹಿತಿಯನ್ನು ಸಂಗ್ರಹಿಸಿ ವಿಶ್ಲೇಷಿಸುವ ಕೌಶಲವನ್ನು ಪಡೆಯುತ್ತಾರೆ.
- 38.ಡಿಜಿಟಲ್ ಹಾಗೂ ಮುದ್ರಿತ ಮೂಲಗಳಿಂದ ಮಾಹಿತಿಯನ್ನು ಬಳಸಿಕೊಳ್ಳುತ್ತಾರೆ.
- 39.ಕಲಿತ ಜ್ಞಾನವನ್ನು ದೈನಂದಿನ ಜೀವನದಲ್ಲಿ ಅನ್ವಯಿಸುತ್ತಾರೆ.
40. ಸ್ವಯಂ ಅಧ್ಯಯನ ಮತ್ತು ನಿರಂತರ ಕಲಿಕೆಯ ಮನೋಭಾವವನ್ನು ಬೆಳೆಸಿಕೊಳ್ಳುತ್ತಾರೆ.

- 1) Understand rational and irrational numbers and their properties.
- 2) Represent rational numbers on the number line.
- 3) Explain the density of rational numbers.
- 4) Express rational numbers in decimal form.
- 5) Prove the irrationality of $\sqrt{2}$ and $\sqrt{3}$.
- 6) Construct the square root spiral.
- 7) Apply computational thinking to represent and reason about numbers.
- 8) Define algebraic expressions and polynomials.
- 9) Identify terms, coefficients, and degree of a polynomial.
- 10) Model linear growth and decay.
- 11) Recognize linear patterns and relationships.
- 12) Determine the slope and y-intercept of a line.
- 13) Graph linear equations in two variables.
- 14) Use computational thinking to analyse linear relationships.
- 15) Recognize sequences and identify patterns.
- 16) Write recursive and explicit rules.
- 17) Find the nth term of Arithmetic Progressions (AP).
- 18) Find the nth term of Geometric Progressions (GP).
- 19) Visualize APs and GPs graphically.
- 20) Apply GP to fractals.
- 21) Solve the Tower of Hanoi puzzle.
- 22) Model patterns using computational thinking.
- 23) Visualize algebraic identities using geometric models.
- 24) Factorize algebraic expressions using identities.
- 25) Interpret quadratic factorization geometrically.
- 26) Simplify rational expressions.
- 27) Apply computational thinking to algebraic simplification.
- 28) Graph linear equations.
- 29) Solve pairs of linear equations graphically.
- 30) Solve by substitution and elimination methods.
- 31) Determine the nature of solutions.
- 32) Model and solve real-life problems using linear equations.
- 33) Represent situations using graphs, tables, and equations.
- 34) Locate points using coordinates.
- 35) Represent floor plans on a coordinate grid.
- 36) Find the distance between two points.
- 37) Check collinearity of three points.
- 38) Find the midpoint of a line segment.
- 39) Verify whether a triangle is right-angled using coordinates.
- 40) Apply computational thinking to coordinate problems.
- 41) Explain the historical development of geometry.
- 42) Describe contributions of Indian, Egyptian, and Greek mathematicians.
- 43) Understand definitions, axioms, and postulates.

- 44) State Euclid's five postulates.
- 45) Define parallel lines.
- 46) Justify constructions using axioms.
- 47) Classify different types of angles.
- 48) Apply theorems related to intersecting and parallel lines.
- 49) Prove vertically opposite angles theorem.
- 50) Identify corresponding, alternate, and interior angles.
- 51) Use logical reasoning in geometric proofs.
- 52) Explain rigidity of triangles.
- 53) Apply SAS, SSS, ASA, AAS, and RHS congruence criteria.
- 54) Prove properties of isosceles triangles.
- 55) Understand propositions and their converses.
- 56) Identify valid and invalid congruence conditions.
- 57) Define quadrilaterals precisely.
- 58) Prove properties of parallelograms.
- 59) Apply midpoint theorem and its converse.
- 60) Determine coordinates of the fourth vertex of a parallelogram.
- 61) Explore symmetry and tessellations.
- 62) Develop logical reasoning through theorem proving.
- 63) Construct the circumcircle of a triangle.
- 64) Apply theorems related to chords and angles.
- 65) Determine cyclic quadrilaterals.
- 66) Relate circles to practical and cultural contexts.
- 67) Solve circle-based geometric problems using logical reasoning.
- 68) Calculate perimeter and circumference.
- 69) Explain the significance of π .
- 70) Find arc length.
- 71) Apply Heron's Formula.
- 72) Find areas of circles, sectors, and cyclic quadrilaterals.
- 73) Recognize mathematical generalizations.
- 74) Apply computational thinking to area problems.
- 75) Compute surface area and volume of cuboids, cubes, cylinders, cones, pyramids, hemispheres, and spheres.
- 76) Recognise three-dimensional objects in daily life.
- 77) Compare and analyse different solids.
- 78) Apply computational thinking to mensuration problems.
- 79) Collect, organize, and interpret data.
- 80) Represent data graphically.
- 81) Calculate mean, median, mode, and weighted average.
- 82) Interpret statistical information for decision-making.
- 83) Analyse real-life data using computational thinking.
- 84) Interpret the probability scale.
- 85) Estimate empirical probability.
- 86) Calculate theoretical probability.
- 87) Use tree diagrams and tables to solve probability problems.
- 88) Model random experiments using computational thinking.

1. Differentiate between plant and animal cells, prokaryote and eukaryote.
2. Describe the structural and functional features of cells.
3. Explain the role of cells in the structure and functions of organisms.
4. Explain activities inside the cell and its interactions with the environment.
5. Demonstrate osmosis in cells.
6. Prepare slides to observe cell structure.
7. Differentiate between diffusion and osmosis.
8. Explain the role of cell division mitosis and meiosis in creating similarities and variations.
9. Identify and describe the role of biomolecules in the structure and function of cells.
10. Cite case study related to the use of science in human life, for example, Leigh Syndrome and mitochondrial dysfunction.
11. Apply learning of the structure and function of muscles cells or joints in dance form and/or sports.
12. Discuss significant contributions of India, for example, Professor Arun Kumar Sharma for his work on chromosomes and methods for its studies
13. Exhibit creativity and design models using low cost or no-cost eco-friendly material to study structure and functions of cell and cell organelles
14. Carry out an experiment to understand the osmosis and analyze result and present finding using scientific terms
15. Differentiate between plant and animal tissues; meristematic and permanent tissues; simple and complex tissues; parenchyma, collenchyma and sclerenchyma; xylem and phloem; striated smooth and cardiac muscles.
16. Explain the role of various types of tissues in plants and animals. Establish the correlation between different tissues for fitness, for example, role of muscles, cartilage and bones in facilitating movement.
17. Discuss significant contributions of India, for example, Professor Sipra Guha Mukherjee and Professor S.C. Maheshwari for their significant contribution in the plant cell and tissue culture research in India.
18. Represent data in multiple modes, including appropriate figures, tables, graphs, or digital formats, interpret and draw inferences from the data.
19. Analyse the interactions between members of different groups of organisms, such as plants and pollinators.
20. Explain how variations are introduced by sexual reproduction .
21. Identify and explain the role of biotic and abiotic agents in seed dispersal and pollination.
22. Compare asexual and sexual reproduction .
23. Illustrate the structure of male and female reproductive units or systems in plants and animals.
24. Recognise the significance of contraceptive devices for population control and health including reproductive health.
25. Describe the contribution of India to the understanding of human anatomy.
26. Recognise the importance of improvements in the medical field for assisted reproductive technologies.

27. Distinguish organisms based on certain characteristics, such as number of cells present, cellular organisation and mode of nutrition.
28. Classify various organisms in groups, such as five kingdoms, on the basis of their cellular organisation and ecological role .
29. Apply binomial nomenclature on some common organisms in their surroundings.
30. Analyse the interactions between members of different groups of organisms, such as lichens.
31. Recognise three domains of classification of organisms on a molecular basis.
32. Differentiate between homogeneous and heterogeneous mixtures on the basis of their properties.
33. Demonstrate separation techniques, such as crystallisation, distillation, paper chromatography, sublimation, centrifugation and coagulation.
34. Classify mixtures as solutions, suspensions, or colloids based on their properties.
35. Define and calculate the concentration of solutions using mass by mass percentage, mass by volume percentage, volume by volume percentage.
36. Analyse graphs of solubility and explain how the solubility of substances changes with temperature.
37. Correlate the phenomenon used in centrifugation to the spinning dance.
38. Demonstrate the use of small-scale or micro-scale experiments, such as crystallisation of copper sulfate, as an alternative to traditional methods.
39. Differentiate between subatomic particles (electrons, protons, and neutrons) based on their charge, and position in the atom.
40. Illustrate how electrons are distributed in different energy levels, such as K, L, M, N ... or by numbers $n = 1, 2, 3, 4 \dots$
41. Explain valence electrons, valency, atomic number, atomic mass, isotopes, and isobars
42. Calculate the number of electrons, protons, and neutrons of an element using its atomic and mass numbers
43. Interpret data, such as atomic mass, maximum number of electrons in a shell, and valency to classify elements accurately
44. Use scientific conventions as per international standards, such as notations for electron, proton, neutron, unified atomic mass unit (u), and distribution of electrons in various shells.
45. Display awareness about the role of Indian scientists and their contributions to atomic science for peaceful purposes and explore how their works influenced India's scientific development.
46. Draw labelled diagrams of various atomic models, such as Thomson's model, Rutherford's model and Bohr's model.
47. Differentiate between chemical species based on their properties or characteristics, such as atoms and molecules, elements and compounds, ionic and covalent compounds, cations and anions, formula unit mass and molecular mass.
48. Plan and demonstrate activities to observe and verify the law of conservation of mass.

49. Explain the Dalton's atomic theory, the law of conservation of mass, the law of constant proportions, and formation of ionic and covalent compounds
50. Calculate the charge on an ion, valency from the atomic number, the molecular and formula unit mass.
51. Handle common laboratory chemicals and apparatus safely.
52. Use scientific conventions, symbols, and valency to write the chemical formulae of simple compounds.
53. Display awareness about the scientific discoveries, such as the contributions of Antoine Lavoisier, Joseph Proust, and John Dalton.
54. Describe how atoms and molecules can lead to beneficial applications, such as medicine, energy and peaceful use of atomic science.
55. Represent data in multiple modes, including appropriate figures, tables, graphs or digital formats.
56. Communicate findings and conclusions effectively, such as those from experiments, activities or projects, both orally and in written form.
57. Explain the interconnectedness between different spheres of the Earth (biosphere, geosphere, hydrosphere, cryosphere and atmosphere)
58. Explain the nature of solar radiation.
59. Explain that solar radiation is an electromagnetic wave having different frequencies.
60. Explain how heat from the Sun warms the Earth's surface differently based on the shape, latitude and tilt of the Earth.
61. Explain the interaction of solar radiation with the Earth's surface and relate the differential heating of the Earth's surface with the atmospheric phenomena, such as air movement, evaporation, etc., and describe phenomena like mountain, valley, sea and land breezes.
62. Explain biogeochemical cycles, and the roles of biogeochemical cycles in circulating matter and energy continuously between the non-living environment (abiotic) and living (biotic) organisms, making nutrients available, and maintaining environmental balance.
63. Draw flow charts, concept maps for biogeochemical cycles, differential heating of the Earth's surface and Electromagnetic spectrum.
64. Differentiate between distance travelled and displacement, and speed and velocity for objects moving in a straight line
65. Define displacement, velocity, acceleration, and uniform circular motion
66. Express displacement, velocity, acceleration in appropriate SI units
67. Plot and interpret position-time graphs and velocity time graphs to describe the motion of an object moving in a straight line in one direction (with constant velocity and constant acceleration)
68. Calculate average velocity from position-time graph, displacement and average acceleration from velocity-time graph.
69. Derive kinematic equations for motion in a straight line with constant acceleration by graphical method.
70. Calculate values of unknown physical quantities from the given physical quantities, using kinematic equations.
71. Derive the expression of speed for uniform circular motion.

72. Explain that force has magnitude as well as direction
73. Identify situations in which balanced and unbalanced forces are acting on an object
74. Explain the role of friction on the motion of objects.
75. Recognise that for an object moving with constant velocity, the net force is zero, whereas a change in velocity (acceleration) is caused by a force.
76. State and explain Newton's first law of motion.
77. State and explain Newton's second law in terms of mass and acceleration
78. Calculate force using mathematical expression of Newton's second law of motion.
79. Apply Newton's laws of motion to explain everyday life events.
80. Calculate work done by a force using mathematical expression.
81. State work-energy theorem • Explain the concept of energy and state its SI unit .
82. Name forms of energy and identify their interconversion in surroundings (elementary idea).
83. Define kinetic energy of a moving object and derive its mathematical expression.
84. Define potential energy for an object raised to a height and derive its mathematical expression.
85. Calculate kinetic and potential energy using mathematical expressions
86. Explain conversion between potential energy and kinetic energy (for the case of an object under free fall).
87. Identify different simple machines (pulley, inclined plane and lever)
88. Define mechanical advantage and calculate its value for simple machine
89. Demonstrate and explain the mechanical advantage of simple machines their conclusions to others.
90. •Demonstrate the production of sound in multiple ways (through vibration of strings, membranes, air columns) using materials in surroundings.
91. Demonstrate that sound can travel through different mediums (air, solid and liquid)
92. Explain that sound travels as a longitudinal wave.
93. Describe the characteristics of sound waves (wavelength, frequency, time period, amplitude, intensity and speed).
94. Analyse graphs representing sound.
95. Write a relationship between time period and frequency of sound wave.
96. Derive mathematical expression for speed of sound.
97. Calculate speed of sound using its mathematical expression .
98. Explain human perception of sound in terms of audible range, loudness and pitch of sound.
99. Describe reflection of sound, and apply it to echo and reverberations in surroundings.
100. Explain the use of sound waves for echolocation.
101. Describe music in terms of characteristics of sound waves, such as loudness and pitch.
102. Display awareness about Sir C.V. Raman.

Chapter	Learning Outcomes (Students will be able to...)
1. Understanding Social Science	• Explain the scope and importance of Social Science. • Recognise how history, geography, economics, and political science are interconnected. • Apply social science concepts to understand society and everyday life.
2. Shaping of the Earth's Surface	• Explain the processes that shape landforms. • Identify major landforms and relate them to human activities. • Analyse the impact of natural processes on the environment and settlements.
3. Atmosphere and Climate	• Explain the composition and structure of the atmosphere. • Analyse factors influencing weather and climate. • Understand climate change and its impact on human life and ecosystems.
4. Early Humans and Beginning of Civilisation	• Describe the evolution of early humans and the development of settled life. • Explain the emergence of agriculture, villages, and early civilisations. • Interpret archaeological evidence to understand the past.
5. State and Society up to 1000 CE	• Explain the evolution of states and societies in ancient India. • Analyse political, social, economic, and cultural developments up to 1000 CE. • Appreciate India's cultural heritage and historical continuity.
6. Democracy	• Explain the meaning, principles, and features of democracy. • Compare democratic and non-democratic systems. • Appreciate the importance of participation, equality, and accountability in democratic governance.
7. Elections	• Describe the electoral process in India. • Explain the role of elections in a democracy. • Recognise the importance of free, fair, and inclusive elections and responsible voting.

8. Building Blocks in Economics: The Problem of Choice	• Explain scarcity, choice, and opportunity cost. • Understand the basic economic problem of resource allocation. • Apply economic reasoning to everyday decision-making.
9. The Price Puzzle: What Drives the Market?	• Explain how demand and supply influence prices. • Describe the functioning of markets. • Analyse factors affecting consumer and producer decisions in everyday life.

Overall Learning Outcomes – Class 9 (New NCERT)

By the end of **Class 9**, learners should be able to:

- Explain the interrelationship between geography, history, political science, and economics in understanding society.
- Use maps, timelines, data, charts, and historical evidence to investigate and interpret social issues.
- Analyse the interaction between natural processes, human activities, and sustainable development.
- Understand the evolution of societies, states, and civilisations, and appreciate India's cultural heritage.
- Explain the principles of democracy, elections, and responsible citizenship.
- Apply basic economic concepts such as scarcity, choice, demand, supply, and markets to real-life situations.
- Demonstrate inquiry, critical thinking, observation, communication, and problem-solving skills.
- Appreciate constitutional values, diversity, environmental responsibility, and ethical decision-making.