

The main thrust of the new syllabus is:

- (a) On equipping the learners with communicative skills to enable them to perform different language functions, and
- (b) Helping them, to develop their cognitive and affective faculties.

Semesterisation is recommended for this course. The entire course will be divided into four semesters. Semester I and II will be covered in class IX and Semester III and IV in Class X.

COURSE CONTENT

The course content will consist of a language package comprising vocabulary and usage and a thematic package by way of basic guidelines for material producers and teachers. As far as the language package is concerned, no attempt has been made at linearisation of grammatical and lexical items. The thematic package is merely suggestive and should be in line with the learners' life experiences and interests.

THE LANGUAGE COMPONENT

I. Elements of Language-In addition to consolidating the grammatical and lexical items acquired earlier, the course will seek to cover the following Items:

- (I) Tense forms
- (II) Reported speech
- (III) The passive voice
- (iv) Modals-auxiliaries
- (v) Non-finites-Infinitives, gerunds, participles
- (vi) Conditional clauses
- (vii) Clauses-Noun, Adjective, Adverbs
- (viii) Question tags
- (ix) Prepositions.

conservation and improvement of environment, conservation of resources, population concerns, disaster management education, adolescence education, forestry, value inculcation, fundamental duties and rights, neighbourhood education, migration education, family life education, safety education, consumer education and education for sustainable development must be suitably incorporated in relevant subject areas at appropriate stages.

SUB-THEMES

1. Personal Relationship

- Self, the family and home; friends and pets
- Family relationships and roles (kinship terms)
- Responsible parenthood
- Family values (respect for elders, etc.)
- Gender equality and equity

2. The neighbourhood

- Social diversity; different languages, religions, customs, etc.
- The values of social cohesion and harmonious living

3. The Larger Community

- The land and the people
- Geography and natural resources
- Sustainable development

4. The Nation

- People-rural, tribal, deprived and challenged
- India's history, myths and legends
- Cultural diversities
- India's contribution to world civilization
- Pride in being an Indian
- India's freedom movement

-Alternative systems of medicine like Reiki and Ayurveda

8.Health with Special Reference to Adolescence Reproductive Health

- Process of growing up
- HIV/Aids
- Education against drug abuse

9.The World of Nature

- Our environment, its protection and preservation
- The wonders of nature
- The mysteries of the sea
- Natural disasters; man versus nature

10.The World of Science and Technology

- Science in everyday life
- Discoveries and inventions that have changed the world
- Communication; Information Technology
- Famous scientists

11.The World of imagination

- Science fiction, mysteries, fantasies
- The supernatural, ghost stories

While developing the above themes the following genres will be used-short stories, plays, biographies, letters, speeches, poems, travelogues, essays, myths and legends and pages from diaries.

- Reciting poems
- Working in pairs and groups
- Using media inputs – computer, television, tapes, videocassettes, software packages.

enquiry help the learners study society from different angles and form a holistic view.

OBJECTIVES

The main objectives of this syllabus are:

- to develop an understanding of the processes of change and development both in terms of time and space, through which human societies have evolved
- to make learners realize that the process of change is continuous and any event or phenomenon or issue cannot be viewed in isolation but in a wider context of time and space
- to develop an understanding of contemporary India with its historical perspective, of the basic framework of the goals and policies of national development in independent India, and of the process of change with appropriate connections to world development
- to develop academic and social skills such as critical thinking, communicating effectively, both in visual and verbal forms, cooperating with others, taking initiatives and providing leadership in solving others' problems.
- to develop qualities clustered around the personal, social, moral, national and spiritual values that make a person humane and socially effective.

| | | |
|---------|---------------------------------|----|
| UNIT IV | Heritage of India | 40 |
| UNIT V | Resources and their Utilisation | 80 |
| UNIT VI | Economic and Social Development | 90 |

Class IX

UNIT I: INDIA IN THE TWENTIETH CENTURY WORLD

CONTENT OUTLINE

- World: Some Major Developments; The Western Europe and Colonialism in Asia and Africa; First World War – Causes and Consequences; Russian Revolution; Peace – Initiatives; League of Nations and Peace Treaties.
- Towards a New World: Development of Fascism and Nazism; Nationalist Movements in Asia and Africa; Second World War- Causes and Consequences.
- Indian National Movement (1) – Impact of British Rule in India; Religious and Social Reform Movements-Impact; Great Uprising of 1857 and Other Popular Uprisings; Indian National Movement (1857 – 1927) – Rise of Extremism; Boycott and Swadeshi Movement; Muslim League; Morley – Minto Reforms; Revolutionary Movements; Emergence of Gandhi; Jallianwallah Bagh Massacre and other Repressive Measures; Khilafat and Non – Cooperation Movement; Swaraj Party.
- Indian National Movement (2) 1927 – 1947 – Simon Commission, Demand for Complete Independence; Civil Disobedience Movement; Peoples Movements; Constitutional Developments; Satyagraha Movement; Quit India Movement; INA; Independence and Partition.
- World After 1945 – U.N. Charter, Cold War- Causes and Consequences, Formation of Military Blocks, Race for Armaments, Use of Atom Bomb, Emergence of Independent States in Asia and Africa, Non- Aligned Movement, Division of Germany and Unification, Disintegration of Soviet Union.

town, subdivision and district accompanied by a report.

Note: Any one activity to be undertaken.

UNIT II: MAKING OF A MODERN NATION

- Political Map of India after Independence, Integration of Princely States, Reorganisation of States, Regional Aspirations and Formation of New States.
- Framing of the Constitution of India – What it stands for: Democracy, Socialism, Secularism and National Integration.
- Main Features of the Constitution: Organs of Government and their Functioning: Governance at the Centre, State and Local Levels; Fundamental Rights, Fundamental Duties and Directive Principles of States Policy.
- Indian Democracy: It's Functioning, Universal Adult Franchise, Public Opinion, Elections, Political Parties, Interest Group.

PROJECT/ ACTIVITY

Debate on

- “Pros and cons of formation of new states on the basis of regional aspirations”.
- Inter group discussion on “Unity in Diversity” depicting languages, dresses and food habits.
- Election of class council, which elects class monitor. During this activity the students will observe the various stages of elections from nomination to the declaration of results and will prepare a report on the same.

Class magazine

- The students will express their views on government policies which they will collect in the form of news clippings from newspapers. Also those issues on which government has modified its own earlier decision because of the pressure of public opinion.

Note: Any two activities to be undertaken.

PROJECT / ACTIVITY

Survey:

- Major landform features of the locality and its influence on social features, i.e. transport communication and settlement.

Activity is to be accompanied by a brief report.

Posters:

- River Pollution
- Rainfall Harvesting
- Depletion of Forests and Global Warming / Soil Erosion.

Note: One activity is to be undertaken.

and apply to solve knowledge of simple trigonometry to solve problems of heights and distances, etc. The history of Mathematics with special reference to India and the nature of Mathematical thinking should find an important place.

COURSE STRUCTURE

Class IX

UNIT I NUMBER SYSTEM (10 Period)

Introduction to Irrational Numbers

Irrational numbers as non-terminating and non-repeating decimals. Real numbers and the real number line. Surds and Rationalization of surds. (Irrational numbers may be introduced by recalling rational numbers as terminating or non-terminating recurring decimals. Problems of proving a number to be irrational number should be avoided. Representing an irrational number on the number line should be avoided for numbers other than $\sqrt{2}$, $\sqrt{3}$ and $\sqrt{5}$. Rationalization of only those surds are to be included which involve square roots and are binomials or trinomials).

UNIT II ALGEBRA (42 Periods)

Factorization of Polynomials

Review of factorisation of algebraic expressions done in earlier classes. Factorisation of polynomials of the form $ax^2 + bx + c$, $a \neq 0$ by splitting the middle term, where a , b and c are real numbers. Factorisation of algebraic expressions of the type $x^3 + y^3$, $x^3 - y^3$, $x^3 + y^3 + z^3 - 3xyz$. Remainder theorem, factor theorem and factorisation of polynomials of degree not exceeding three. (While factorisation of the polynomial $ax^2 + bx + c$, $a \neq 0$, a , b , c should be rational or square root of naturals only. (1) If $a + b + c = 0$, then $a^3 + b^3 + c^3 = 3abc$. Questions involving above concept will be included. (2) Simple expressions reducible to the form $a^3 + b^3 + c^3 - 3abc$ may be included).

Ratio and Proportion

Recall of the concepts of ratio and proportion. Continued proportion, invertendo, alternendo, componendo and dividendo.

Discount

Discount / rebate including successive discounts. (Not more than three successive discounts should be taken).

Compound interest

Compound interest when the interest is compounded yearly, half yearly and quarterly. Rate of growth and depreciation. Conversion period not more than four (Rate should be 4%, 5% or 10%).

Cost of Living Index

Cost of living Index and its computation (weighted aggregate method only).

Sales Tax

Computation of sales tax including inverse problems.

Banking

1. Different types of accounts in a bank.
2. Calculation of interest on savings bank account from a pass book.
3. Calculation of interest on FD accounts. (Teacher may take the students to a bank to show the various facilities available to the customers and process of calculation of interest thereon).

UNIT IV GEOMETRY

A number of propositions in Geometry are listed below. Most of them have already been learnt at the upper primary stage through activities / experiments. At this stage, the purpose is to acquaint the pupil with the nature and method of a geometrical proof. In order to ensure that the burden on the pupil is not much, only proofs of some selected propositions may be asked in the examination. These propositions may be selected in such a way that they reflect different types of proofs such as direct proof, proof by contradiction, proof by exhaustion, proof by various applications of the previous propositions. Keeping this in view, some propositions have been marked with '*'. In view of the above:

1. The truth of the unstarred propositions should be brought home to the pupils by either recalling them from earlier classes or by verifying them experimentally in

3. Given a line and a point, not on the line, there is one and only one line which passes through the given point and is parallel to the given line.
4. If a ray stands on a line, then the sum of the two adjacent angles so formed is 180° , and its converse.
5. If two lines intersect, the vertically opposite angles are equal.
6. If a transversal intersects two parallel lines, then any pair of corresponding angles are equal and its converse.
7. If a transversal intersects two parallel lines, then a) Each pair of alternate angles is equal b) The interior angles on the same side of the transversal are supplementary.
8. Converse of (7).
9. Lines which are parallel to a given line are parallel to each other.
- *10. The sum of the angles of a triangle is 180° .
11. If a side of a triangle is produced, the exterior angle so formed is equal to the sum of two interior opposite angles.

Congruence of Triangles

1. Two triangles are congruent if any two sides and the included angle of the one triangle are equal to any two sides and the included angle of the other triangle.
- *2. Two triangles are congruent if any two angles and the included side of one triangle are equal to any two angles and the included side of the other triangle.
3. Two triangles are congruent if the three sides of one triangle are equal to the three sides of the other triangle.
- *4. The angles opposite to equal sides of a triangle are equal.
5. The sides opposite to equal angles of a triangle are equal.
- *6. Two right triangles are congruent if the hypotenuse and a side of one triangle are respectively equal to the hypotenuse and a side of the other triangle.

Inequalities in a Triangle

1. If two sides of a triangle are unequal, the larger side has the greater angle opposite to it.
- *2. In a triangle, the greater angle has a larger side opposite to it.

3. Medians of a triangle pass through the same point which divides each of the medians in the ratio 2:1.
4. In a triangle, the three altitudes pass through the same point.

Parallelograms

1. A diagonal of a parallelogram divides it into two congruent triangles.
2. In a parallelogram, the opposite sides are of equal length and its converse.
3. In a parallelogram, the opposite angles are equal and converse.
- *4. A quadrilateral, is a parallelogram if a pair of its opposite sides is parallel and is of equal length.
3. In a parallelogram, the diagonals bisect each other and its converse.
4. A parallelogram is a rectangle if its diagonals have equal length and its converse.
5. A parallelogram is a rhombus if its diagonals are perpendicular and its converse.
6. A parallelogram is a square if its diagonals are equal and are at right angles and its converse.
- *9. In a triangle, the line segment joining the mid points of any two sides is parallel to the third side and is half of it.
- *10. The line drawn through the mid point of one side of a triangle parallel to another side bisects the third side.
- *11. If there are three or more parallel lines and the intercepts made by them on a transversal are equal, the corresponding intercepts on any other transversal are also equal.

5. Construction of a triangle equal in area to a given quadrilateral.

- [(i) Proofs of constructions not required.
- (ii) Constructions using ruler and compasses only.]

UNIT V TRIGONOMETRY

(16 PERIODS)

Trigonometry Ratios

Formation of angles through rotation of a ray. Idea of positive and negative angles. Trigonometric ratios of an acute angle of a right angled triangle. Trigonometric ratios of 0° , 30° , 45° , 60° , 90° . Geometric proofs of trigonometric ratios of 30° , 60° , 45° . Given a trigonometric ratio, to find all other trigonometric ratios. Given a side and an angle of a right triangle, to find other sides and angle.

UNIT VI MENSURATION

(15 PERIODS)

Plane Figures

Area of a triangle using Hero's formula. Area of a quadrilateral. Area of sector of a circle. Area of segment of a circle. Further problems based on areas and perimeter / circumference of the above said plane figures. (In calculating area of segment of a circle, problems should be restricted to central angle of 60° , 90° and 120° only). (Plane figure involving square, rectangle, triangle, trapezium, quadrilateral, parallelogram, rhombus and circle should be taken).

Solids

Recognition of some more solids: Prism, pyramid/tetrahedron and octahedron. Volume and surface area of a) Right triangular prism b) Right pyramid with equilateral triangle as base (tetrahedron). (Simple problems of volume and surface area of right triangular prism and right pyramid with equilateral triangle as base should be taken).

Measures of Central Tendency

Mean of raw and ungrouped data. Median and mode of raw data. [(i) Properties of mean, median and mode may be given to highlight their significance and use. (ii) Not more than 10 observations should be taken for calculation of median and mode.]

Class X

UNIT I ALGEBRA

(55 PERIODS)

Linear Equations in Two Variables

System of linear equations in two variables. Solution of the system of linear equations i) Graphically. ii) By algebraic methods: a) Elimination by substitution b) Elimination by equating the co-efficient c) Cross multiplication. Applications of Linear equations in two variables in solving simple problems from different areas. (Restricted upto equations with integral values as a point of solution. Problems related to life to be incorporated).

Polynomials

HCF and LCM of polynomials by factorisation.

Rational Expressions

Meaning of rational expressions. Reduction of rational expressions to lowest terms using factorisation. Four fundamental operations on rational expressions. (Properties like commutativity, associativity, distributive law etc. not to be discussed. Cases involving Factor theorem may also be given).

Quadratic Equations

Standard form of a quadratic equation $ax^2+bx+c=0$, ($a \neq 0$). Solution of $ax^2+bx+c=0$ by (i) factorisation (ii) quadratic formula. Application of quadratic equations in solving word – problems from different areas. (Roots should be real) (Problems related to day-to-day activities to be incorporated.)

Calculation of income tax for salaried class. (In case of income tax problems, annual salary should be exclusive of HRA.)

UNIT III GEOMETRY

(55 PERIODS)

A number of propositions in Geometry are listed below. Some of them have already been learnt at the upper primary stage through activities/experiments. At this stage, the purpose is to acquaint the pupil with the nature and method of a geometrical proof. In order to ensure that the burden on the pupil is not much, only proofs of some selected propositions may be asked in the examination. These propositions in such a way that they reflect different types of proofs such as direct proof, proof by contradiction, proof by exhaustion, proof by various applications of the previous propositions. Keeping this in view, some propositions have been marked with “*”. (For the verification of geometrical results, teacher may use different types of activities such as models, paper cutting, paper folding, measurement etc. The students should also be encouraged to perform these activities themselves). In view of this:

- a. The truth of the unstarred propositions should be brought home to the pupils by either recalling them from earlier classes or by verifying them experimentally in the present class.
- b. The proofs of only ‘*’ marked propositions may be asked in the examination.
- c. The riders on ‘*’ propositions only may be asked in the examination. However, they may involve the use of other results (unstarred ones).
- d. The unstarred propositions should not be asked as riders/exercises in the examination.

Similar Triangles

- *1 If a line is drawn parallel to one side of a triangle, the other two sides are divided in the same ratio.
2. If a line divides any two sides of a triangle in the same ratio, the line is parallel to the third side.

remaining two, the angle opposite the first side is a right angle.
10. The internal bisector of an angle of a triangle divides the opposite side in the ratio of the sides containing the angle and its converse.

Circles

1. Two circles are congruent if and only if they have equal radii.
2. Equal chords of a circle subtend equal angles at the centre and conversely, if the angles subtended by the chords at the centre (of a circle) are equal, then the chords are equal.
3. Two arcs of a circle are congruent if the angles subtended by them at the centre are equal and its converse.
4. If two arcs of a circle are congruent, their corresponding chords are equal and its converse.
5. The perpendicular from the centre of a circle to a chord bisects the chord and conversely, the line drawn through the centre of a circle to bisect a chord is perpendicular to the chord.
- *6. There is one and only one circle passing through three given non-collinear points.
7. Equal chords of a circle (or of congruent circles) are equidistant from the centre(s) and conversely, chords of a circle (or of congruent circles) that are equidistant from the centre(s) are equal.
- *8. The angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.
9. The angle in a semi-circle is a right angle and its converse.
- *10. Angles in the same segment of a circle are equal.
11. If a line segment joining two points subtends equal angles at two other points lying on the same side of the line containing the segment, the four points lie on a circle.
- *12. The sum of either pair of the opposite angles of a cyclic quadrilateral is 180° .
13. If a pair of opposite angles of a quadrilateral is supplementary, then the quadrilateral is cyclic.
14. The tangent at any point of a circle is perpendicular to the radius through the point of contact.

Constructions

1. Construction of tangents to a circle i) At a point on it without using the centre. ii) From a point outside it. [(i) Proofs of constructions not required. (ii) Constructions using ruler and compasses only].
2. Construction of incircle and circumcircle of a triangle with given sides.
3. Construction of a triangle, given base, vertical angle and either altitude or median through the vertex.
4. Construction of figures (triangles, quadrilaterals) similar to the given figure as per the given scale factor.

$$\cot(90^\circ - A) = \tan A$$

Problems based on above.

Heights and Distances

Simple Problems on heights and distances.

- i. Problems should not involve more than two right triangles.
- ii. Angles of elevation/depression should be only 30° , 45° , 60° .

UNIT V MENSURATION

(15 PERIODS)

Volumes and Surface Areas

- iii. Problems on finding volumes and surface areas of combinations of right circular cone, right circular cylinder, hemisphere and sphere. Frustum of a cone.
- iv. Problems involving converting one type of metallic solid into another and other mixed problems. (Problems with combination of not more than two different solids be taken).

UNIT VI STATISTICS

(15 PERIODS)

Mean

Mean of grouped data. (Calculation by assuming 'assumed mean' should also be discussed).

Probability

Elementary idea of probability as a measure of uncertainty (for single event only).

Pictorial Representation of Data

Reading and construction of pie chart. [(i) Subparts of pie chart should not exceed five). (ii) Central angles should be in multiples of 5 degrees].

UNIT VII COORDINATE GEOMETRY

(15 PERIODS)

Co-ordinate Geometry

Distance between two points. Section formula (internal division only).

technology were included in the science curricula, a renewed emphasis has been laid on technology in the present science and technology curriculum.

It is envisaged that the present course in science and technology would facilitate development of essential scientific and technological attitudes and skills among children that would form the foundation for their future growth. Therefore, in the present syllabus, an attempt has been made to integrate science and technology especially in areas, such as food, health and nutrition, agriculture, energy and industry. It is expected that it would help children to relate their knowledge of science and technology in their day-to-day life as also in different areas of national development.

Course Structure

| Theme | Class IX | Class X |
|-------------------|-------------------------------------|-------------------------------------------------------------|
| Unit | Unit | Unit |
| Matter | 1. Matter – Nature and Behavior | 1. Chemical Reactions and some important chemical compounds |
| Energy | 2. Motion, Force and Work | 2. Energy |
| Living World | 3. Organisation in the Living World | 3. Life Processes |
| Natural Resources | 4. Natural Resources | 4. Natural Resources |
| Environment | 5. Our Environment | 5. Our Environment |
| The Universe | | 6. Exploring Space |

THEME: MATTER

UNIT 1: MATTER – NATURE AND BEHAVIOUR

Measurement in Science and Technology:

Historical developments (in brief), international system of units, maintenance of standards.

Periodic Classification of Elements: A brief historical perspective of periodic classification of elements, periodic law, modern periodic table of 18 column, variation in properties across a period and along a group-metallic and non-metallic, atomic size, ionization energy, and electron affinity.

Chemical Bonding: Formation of chemical bond, types of bonds- ionic and covalent, electronegativity and a polar covalent bond, properties of ionic and covalent compounds.

Chemical Reactions: Formulae of simple compounds, equation of simple chemical reactions and their balancing. Types of chemical reactions – combination, decomposition, displacement (single and double displacement), oxidation and reduction (in terms of gain/loss of electrons).

THEME: ENERGY

UNIT 2: MOTION, FORCE AND WORK

Motion: Motion- in living and non-living. Uniform and non-uniform motion (one direction)-distance and displacement, velocity and acceleration: distance- time and velocity-time graphs for uniform and uniformly accelerated motion, derivation of equations of motion by graphical method, uniform circular motion (qualitative idea only).

Force: Force and motion: Newton's laws of motion-inertia of body, inertia and mass, momentum, force and acceleration, conservation of momentum, action and reaction, conservation of momentum, action and reaction forces, Friction – factors affecting friction, sliding and rolling friction, examples of advantages and disadvantages of friction, control of friction (qualitative idea only). Thrust and Pressure – Archimedes' principle and its application, relative density.

Gravitation: Universal law of gravitation – force of gravitation of the earth (gravity). Effect of gravity on plants, (in brief), acceleration due to gravity, mass and weight, free fall, motion of a projectile with initial horizontal velocity (qualitative idea only).

application. Reflection of sound. Echo, SONAR.

THEME: LIVING WORLD

UNIT 3: ORGANISATION IN THE LIVING WORLD

Cell and Cell Structure: Cell structure, difference between prokaryotic and eukaryotic cell, functions of cell organelles (brief account), cell division – mitosis (different stages), elementary idea of meiosis.

Tissues: Plant tissues – Structure and functions (meristematic and permanent – protective only); animal tissues – structure and functions (epithelial, connective, muscular and nervous).

Diversity in the Living World: General idea of classification of living organisms and their importance, nomenclature, classification (two kingdoms) with characteristics and examples up to phylum in plants and invertebrate animals and class levels in chordate animals.

Food, Nutrition and Health: Health and its importance (WHO definition), community and personal health; conditions essential for good health (nutrition, proper habits, exercise and relaxation), components of food (nutrients in food, their sources and functions), balanced diet, under-nutrition and malnutrition, food adulteration (definition, common food adulterants, their tests and harmful effects); quality of drinking water.

Human diseases: Diseases- definition, source and types of diseases (communicable and non – communicable diseases), mode of spread of communicable diseases, symptoms, prevention and control of some diseases (malaria, influenza, cholera, diarrhoea, jaundice, typhoid, rabies, AIDS, tuberculosis).

Deficiency Diseases: Protein energy malnutrition (marasmus and kwashiorkor), vitamin deficiency (scurvy, rickets, beriberi, pellagra, xerophthalmia), mineral deficiency (anaemia, goitre).

Food Resource – Crop Production System: Human dependence on plants and animals for food, plants and animals as sources of food, macro and micro – nutrients as plant food, manures and fertilizers. Water – judicious use, irrigation systems; crop protection – major plants pests and diseases, diseases and their control, scientific storage of grain.

Food Resource – Sustainable Agriculture: Mixed farming, mixed cropping, crop rotations (biological and economic considerations), varietal improvement through breeding and selection.

Food resource – Animals: Improved breeds cattle and livestock (poultry and fish), breeding, feeding and shelter for livestock, prevention against major diseases.

THEME: ENVIRONMENT

UNIT 5: OUR ENVIRONMENT

Our Environment: Habitat and Adaptation– Habitat and its types, adaptation in plants and animals, causes and effects of alteration of habitats on organisms, conservation of habitats.

Biosphere – ecosystem and biosphere, structure of an ecological system, food chain, food webs, trophic levels, function of an ecological system, flow of energy, biogeochemical cycles of materials (carbon and nitrogen), types of ecosystems, biomass, biodiversity and its importance.

cement, glass and steel.

THEME: ENERGY

UNIT 2: ENERGY

Light: Nature of light, reflection of light – laws of reflection, of light- reflection from plane and curved surfaces, mirror – plane (concave and convex), sign convention, derivation of mirror formula, magnification.

Refraction of light: Laws of refraction, refraction through a rectangular slab, image formation by concave and convex lenses, lens formula (with simple treatment), sign convention, power of a lens, some optical phenomena in nature (twinkling of stars, mirage), defects of vision and their correction.

Optical instruments: Construction and working of a compound microscope and an astronomical telescope.

Dispersion: Dispersion of white light by a glass prism; composition of white light, colour of objects and pigments, primary colours of light and pigments, superposition of light or primary colours.

Electricity and its Effects: Potential and potential difference, electric current, Ohm's Law, combination of resistances in series and parallel; heating effects of electric current and its application. Power, commercial unit of electrical energy.

Chemical Effects of Current: Electrolysis Faraday's Laws (excluding equations), electroplating, electrochemical cells – dry cells.

Magnetic Effect of Current: Magnetic field due to current carrying conductor – straight, coil, solenoid (qualitative idea), domestic electric circuits, safety measures in using electricity.

Sources of Energy: Renewable and non- renewable sources, Renewable sources – solar energy (solar cooker, solar water heater, solar cell), wind energy hydro energy (tidal, ocean, thermal, hydroelectric), geothermal, wood, biogas, hydrogen

respiration (aerobic and anaerobic), respiration through skin, gills, air tube, lungs (earthworm, fish, grasshopper and humans); structure and functions of respiratory organs in humans (elementary idea).

Transportation: Transportation in plants and animals; transportation in plants (water and minerals, food), transportation in humans- role and composition of blood, blood clotting, blood groups and blood transfusion; structure and function of heart and blood vessels (elementary idea), lymphatic system.

Excretion: Excretion in animals, (amoeba and earthworm); excretion in humans; osmoregulation.

Life Processes-II: Control and Coordination–Coordination in plants and animals–nervous system and hormones in human beings, reflex action.

Reproduction: Types of reproduction – asexual (fission, budding, regeneration); vegetative propagation in plants- cutting, grafting and layering: parthenogenesis; sexual reproduction and its significance, reproductive parts in plants, pollination and fertilization, human reproductive system-sexual cycle in females, fertilization, population control, reproductive health; sexually transmitted diseases.

Heredity and Evolution: Heredity and variation; physical basis of heredity-chromosomes, DNA (elementary idea only), genes; sex determination elementary idea of genes; sex determination (elementary idea of organic evolution).

THEME: NATURAL RESOURCES

UNIT 4: NATURAL RESOURCES

Metals and Non- Metals: Metals – Minerals and ores; metallurgy-enrichment of ores, extraction of metals from ores, their refinement and purification (with reference to iron and aluminium). Activity series of metals, general properties and corrosion of metals. Alloys – components, properties and uses of steel, stainless steel, brass and magnesium, Alloying of gold.

Non- metals- importance and general properties; preparation, properties and uses of hydrogen, Manufacture of ammonia- reaction only, its properties and uses, Sulphur

problems. Biodegradable and non-biodegradable materials, ecological balance-sustainable development, inter-relationship of population, environment and development. Efforts for conservation and protection of the environment: environmental laws (mention only).

THEME: THE UNIVERSE

UNIT 6: EXPLORING SPACE

Exploring Space: Solar System – Planets, asteroids, comets and meteors; earth – evolution and structure, Stars, constellation, night sky, milky way, galaxy, structure of universe and its theories.

Space Exploration- (a brief history): Elementary ideas about space launching vehicles; different types and artificial satellites and their orbits, applications of artificial satellites and their orbits, application of artificial satellites – in communication, weather monitoring, remote sensing; space science programmers in India (an overview).

Suggested Practical Exercises

Class IX

(TOTAL PERIODS 60)

A student is expected to perform at least fifteen practical exercises from the list suggested below; at least one exercise from each unit.

- **MATTER, NATURE AND BEHAVIOUR**

- To prepare a solution of common salt/ sugar of a given percentage composition by mass.
- To prepare a colloidal solution of sulphur and differentiate it from (i) true solution, and (ii) suspension on the basis of transparency and filtration criterion respectively.
- To differentiate between a mixture (containing two components) and pure compound.
- To carry out the following chemical reactions and record observations: (i) iron nail with copper sulphate solution in water, ii) burning of magnesium ribbon in

- To determine the boiling point of water and melting point of a solid (ice, urea).
 - To determine the specific heat of a metallic solid (of known mass) using the method of mixtures.
 - To measure the temperature of hot water as it cools and plot a temperature – time graph.
 - To determine the velocity of a pulse propagated through a stretched string/ slinky.
- **ORGANISATION IN THE LIVING WORLD**
 - To prepare temporary mount of onion peel, cheek epithelial cells and spirogyra, identify their parts and draw labeled diagrams.
 - To identify and draw labeled diagrams of different stages of mitosis from prepared slides.
 - To identify different types of plants (parenchyma, collenchyma, sclerenchymal) and animal tissues (striated muscle, nerves, blood) from prepared slides and draw their diagrams.
 - To test the presence of glucose and starch in the given samples of food materials.
 - To test the presence of adulterants in a given sample of food material, turmeric or coriander (in powdered form).
- **NATURAL RESOURCES**
 - To distinguish between saturated and unsaturated organic compounds.
 - To prepare carbon dioxide gas and study its properties.
 - To test different samples of soil (4-5 samples) for its acidity and alkalinity.
- **OUR ENVIRONMENT**
 - To study adaptive features of xerophytes, hydrophytes and mesophytes.
 - To prepare a temporary mount of leguminous root nodules to study bacteria.
 - To study the external structural adaptations of any two in respect of their terrestrial (cockroach) aquatic (fish, prawn) amphibious (toad, frog), reptilians (lizards, chameleons), aerial (birds) and burrowing (mole, rat, earthworm) features.

- To verify the dynamic nature of equilibrium by conducting any two reversible reactions.
- (a) To carry out the reactions of an acid (HCl) with (1) litmus solution (blue and red), (II) zinc metal (III) sodium carbonate, and (iv) sodium hydroxide.
- (b) To carry out the reactions of a base (NaOH) with (1) litmus solution (blue and red), (II) aluminium metal, and (III) hydrochloric acid.

• ENERGY

- To verify the laws of reflection of light using plane mirror.
- To determine the focal length of a concave mirror by obtaining image of a distant object.
- To trace the path of a ray of light passing through a–rectangular glass slab and measure the angle of incidence and the angle of emergence.
- To determine the focal length of a convex lens by focusing a distant object.
- To trace the path of a ray of light passing through a glass prism and measure the angle of deviation.
 - To study the dependence of current on the potential difference across a resistor and determine its resistance.
 - To find out the resultant resistance of two resistors connected In (1) series, and (II) parallel.

• LIFE PROCESSES

- To prepare a temporary mount of a (i) leaf, and (ii) peel to show its stomata.
- To study binary fission for budding with the help of prepared slides.
- To determine the percentage of water absorbed by raisins.
- To show that light is necessary for photosynthesis.
- To show that oxygen evolves during photosynthesis.
- To show that carbon dioxide is produced during respiration.
- To show transpiration in plants.

- To study the comparative cleansing capacity of a sample of soap in (i) soft water and (ii) hard water.
- To prepare soap by cold process.

organisation, colours, forms, lines, texture, movement, sound, etc., learners develop a sense of organisation and a sense of design which inculcates in them a sense of order with regard to their personal appearance, home, school and community. It also develops aesthetic sensibilities and respect for social values and cultural heritage.

In the interest of the learner we shall try as far as possible, to put all the media of creative arts before the students for their choice of selection in one form of art or in a combination of art forms. These are:

a. Visual Arts

- Two- dimensional or Pictorial
 - Drawing and Painting
 - Collage Making
 - Print Making
 - Photography
 - Computer Graphics (wherever possible)
- Three – dimensional
 - Clay Modelling and Pottery
 - Carving and Sculpture
 - Construction

b. Performing Arts

- Music (Vocal, instrumental)
- Movement and Dance
- Creative Drama and Puppetry

c. Creative writing and Poetry

two dimensional space with two-dimensional and three-dimensional shapes and forms

- Sketching from nature and surrounding
- Creative use of colours to show space, atmosphere, subjective moods
- Creative use of perspective in spatial relationship
- Study of calligraphic strokes of Devnagari and Roman alphabets (scripts)
- Use of contrast as an expressive element of art.
 - o Study and use of various media and techniques to the extent of their availability
- Pencil, charcoal, water colour, crayon, oil colours, poster colour and gouache, acrylic colour and other unconventional sources of colours such as vermilion, yellow and red earth, rice flour, and tools like painting brushes for water colours and oil colours. Painting surfaces such as papers of various kinds and quality, like smooth, rough, thick, thin, etc, canvas, hardboard, simple marking cloth pasted on paper, etc.
- Collage and mosaic work with a variety of coloured printed pictures / photographs from magazines and newspapers
- Print Making: Mono printing, Printing with wood- cut blocks, lino-cut and metal foil : serigraphy (silk screen), self- made stencil, etc.
- Basic knowledge of computer graphics (wherever possible).

Three-dimensional or sculptural activities

- Study of various materials such as clay, plaster of paris, soft-stone, wood. (bocks, twigs and branches, roots, etc,.) metal scraps, plastic sheets, wire thread, papers and cardboards, vegetables and other throw- away available materials
- Study of natural and man-made forms, human figures, birds, animals, vegetation and other objects like household items, buildings or as desired by the students
- Objects of day-to-day use in groups and in different settings and arrangements.

- Science and Environment Studies activities.
- Constructing stage setting props such as curtain, backdrops, stage lighting, improvised furniture sets, etc., designing utility (crafts) items; correlating with Work Education activities.
- Designing the school magazine and bulletin boards, making posters for school function, and greeting/ invitation cards, stage scenes for music, dance, drama performances, etc., correlating with applied art activities.

Note: These activities and other group activities may emerge in project form at individual levels also.

GROUP ACTIVITIES

- Organisation, display and exhibitions of students periodical and sessional work.
- Organising inter-school art exhibitions to widen their interaction and horizon.
- Planning and organising festivals and celebrations of the community, cultural evenings, musical concerts, film shows and other performances including regional and folk (traditional art forms).
- Participating in study visits to museums, botanical gardens, zoological garden, and art galleries and art institutions, etc., for greater awareness of the environment and cultural variations.

Theoretical Understanding of Art and Culture

- Short notes on important aspects of Indian art and culture based on social studies. Such writing may be based in Textbooks.
- Contribution made by any one contemporary artist.
- Knowledge of terms: Contour, texture, graphic, form, volume, space, tone, printmaking, collage, armature, modelling in relief, mobile construction, appliqué, calligraphy, layout, poster and composition.

- Fifteen songs for community singing
- Five folk or tribal songs of different regions, indicating time of the year, occasion and the function with which they are related. Writing down the same with its meaning and knowledge of its rhythm.
- Five devotional songs, Bhajans from the saint-poets of India
- Three songs in regional languages other than mother tongue, including one Tagore song
- Three patriotic songs or on the theme of universal love and amity
 - o To create proper sense of swara and laya through Talabadh and Alankaras.
 - o Introduction to the structure of any four of the following ragas with details: Yaman, Kafi, Khamaj, Bhopali, Nattai, Kalyani, Saveri Todi (accompaniment of Tanpura and Tabla or Mrudang). The Teacher should communicate the characteristic features of the raga and its swaras patterned in such a way that the students will be able to recognize the qualities of the raga and the art played by different swaras.
 - o The following talas and their thekas-kaharwa, Dadra, Trial, Jhaptal, Choutal, Alankar Talas.

community level and also their roles in that context. Physical education has to concentrate on developing health, strength and fitness of the body.

SYLLABUS CLASS IX

HEALTH EDUCATION

- Meaning and nature of health, ecological concept of health, interdependence of physical, mental, emotional and social dimensions of health, factors and conditions influencing health, importance of health, meaning, purpose, principles and methods of health education; role of media in Health Education.
- Environmental conditions in villages, towns and slumps in relation to the health status of people, waste disposal practices, measures to prevent pollution, compost pits, soakage pits, sanitary latrines, sources of safe drinking water, municipal water supply system, healthful housing.
- Relationship of personal and environmental health practices with prevention of diseases and health promotion, cultural practices and health.
- Major accidents which cause deaths in rural and urban areas, factors responsible for accidents, general principles for prevention of common accidents, safety rules related to lighting fires, using stoves / cooking gas, using electricity, climbing stairs, crossing roads, boarding means of transport, cycling, swimming, playing, storing medicines and poisonous chemicals, practicing crafts, working in laboratories and using electrical and mechanical gadgets and machines, measures to remove accident hazards.
- First-aid measures for cuts, wounds, sprains, strains, continuous bleeding, fractures, bites and stings, drowning, fainting, shock burns: principles of first-aid, home nursing and skills in dealing with specific situations.
- Review of body structure and functions, meaning of growth and development, factors influencing growth and development, individual differences in growth and development, growth and development of children at different ages, their special needs with emphasis on their nutritional needs. Characteristics of growth of boys and girls in adolescent stage, their needs and interests, emotional problems of adolescents and

o Athletics

- Track Events: 100m, 200m, 400m, 1500m, 300m
- 100m Flat Running
- 200, 400m, sprints
- starting from the Curves- Finding the Blocks
- Curve Running
- Body Position: start and finish
- Distance Running-800m, 1500m, 300m for boys, 800m for girls
- Leg Action
- Foot Placement
- Stride length
- Arm and Shoulder action
- Body Angle
- Training with various methods
- Triple Jump
- Approach run, take off and landing for hop- step and jump, mid-air action, landing
- Discus Throw
- Holds, spinning, initial stand and preliminary swing turn, delivery stance, delivery and reverse.

o Major games (any two)

Badminton (shuttle)

Repetition of skills; skills; serving, spin, underhand receiving, back hand, forehand, spin service, flat service, smash, push/chapping, tossing, returning smash, pushing / chapping, float; practice of the game.

Basketball

Repetition of the skills; skills-passing one hand pass, book pass, baseball pass; shooting- two handed shot, set shot, lay up shot, jump shot; dribbling; pivoting; rebound taking; screening; training; various type of drills to develop the techniques.

GUJARATI Code No. 010

Class IX

Section – A

1. Grammar

- a. Recognition of Parts of speech
- b. Synonyms and Antonyms
- c. Sandhis and Samas

2. Composition

- a. Paragraph Writing (one) on descriptive topics or Developing a story from the given topics
- b. Letter writing (personal)

3. Comprehension of an Unseen Prose passage (Descriptive & Narrative)

Section - B

1. Prose (*Short questions based on the text*)

2. Poetry

(Questions requiring explanations, reference to context and appreciation of the prescribed poems)

3. Supplementary Reading (*Swadhayan*)

(Questions on plot, characterization, general appreciation)

Prescribed book:

| | | |
|-----|--------------------------|------------------|
| — | Parthani Parthani Mora | R.V. Patilak |
| 5. | Nanum Sarkhun Gokalium | Narsinha Mehta |
| 18. | Attariyane | Balmukund Dave |
| 9. | Bansiwala Ajao mare desh | Mirabai |
| 15. | Bano Photograph | Sundaram |
| 19. | Mari Balla | Harindra Dave |
| 31. | Duho, Muktak, Kaiku | Dalapataram etc. |

Supplementary Reading (Swadhyayan)

| | | |
|-----|--------------------|----------------|
| 4. | Jabuchacha (Prose) | Madhav Ramanuj |
| 11. | Dhuvandhar (Prose) | Kaka Kakelkar |
| 19. | Swatantrata (Poem) | Hasit Buch |

CLASS X

Section – A

1. Grammar

(i) Transformation of Sentences

Rewriting and reframing of sentences with given proviso e.g. substitution of nouns with different genders, transformation of active and passive voices, joining of different sentences together, change of certain phrases, removal of idioms and proverbs, substitution of synonyms and antonyms, changes from singular into plural and vice versa.

(ii) Change of Tense

Reframing of given sentences after changing their tenses as directed e.g. present to past, present to future, past to future, future to past, future to present, past to present.

(iii) Correction of errors in given sentences

2. Composition

(a) Essay Writing on reflective and narrative topics

(b) Letter Writing (Personal, Official, to the Editor)

(c) Precis Writing

Prose: Lessons to be studied:

1. Jumo Bhisti
3. Lohi ni Sagai
4. Thingadun
5. Shruti ane Smruti
6. Be Laghukatha
7. Pruthvivaliabha Kem Khanchayo
8. Satya ane Ahimasa
9. Madhyahna nu Kavya
12. Bhankara

(09)

- Dhumketu
Petikar
Suresh Joshi
C.Bakshi
Mohanlal Patel
K. Munshi
Gandhiji
Kalelkar
Chandarvakar

Poetry: Poems to be studied:

1. Bhaj re Bhaj tun
4. Chhapa
7. Have Hun Sakhia
8. Mehamanone Sambodhan
11. Chhello Katoro
12. Hun to Chahun
18. Man

(07)

- Narsinha Mehta
Akho
Dayaram
Kant
Meghani
Manuskhalal Zaveri
Niranjan Bhagat

Supplementary Reading: (Swadhyayan)

Prose: Lessons to be studied:

2. Aagagadi na anubhavo
3. Mahadevabhai ni Dayari
4. Ek – Ekarar
5. Phakta Pandar

(04)

- Ramanbhai Nilkantha
Mahadev Desai
Indulal Yagnik
Vibhut Shah

Poems: Poems to be studied:

4. Smruti Bhram
5. Manas Khovaya Chhe

(02)

- Panna Nayak
Shyam Sadhu