

SHIVALIK PUBLIC SCHOOL

SCIENCE -(SUBJECT CODE - 086)

SYLLABUS FOR PURPOSE OF EXAMINATION 2021-22

CLASAS– X (2021-22)

The subject of science plays an important role in developing well-defined abilities in cognitive, affective, and psychomotor domains in children. It augments the spirit of enquiry, creativity, objectivity, and aesthetic sensibility.

Upper primary stage demands that a few opportunities should be provided to the students to engage them with the processes of science like observing, hypothesizing, experimenting recording observations, drawing, tabulation, plotting graphs, analyze and drive conclusions etc., whereas the secondary stage also expects abstraction and quantitative reasoning to occupy a more central place in the teaching and learning of science. Thus, the idea of atoms and molecules being the building blocks of matter makes its appearance, as does Newton's law of gravitation.

The present syllabus has been designed around seven broad themes viz. Food; Materials; The World of the Living; How Things Work; Moving Things, People, and Ideas; Natural Phenomenon and Natural Resources. Special care has been taken to avoid the temptation of adding too many concepts than can be comfortably learnt in the given time frame. No attempt has been made to be comprehensive.

At this stage, while science is still a common subject, the disciplines of Physics, Chemistry and Biology begin to emerge. The students should be exposed to experiences based on hands - on activities as well as modes of reasoning that are typical of the subject.

General Instructions:

1. The total Theory Examinations (Term I+II) will be of 80 marks and 20 marks weightage shall be for Internal Assessment (Term I+II).
 2. Internal Assessment - Maximum Marks 10 for each Term:
 - a There will be Periodic Assessment that would include:
 - Three periodic tests will be conducted by the school in the entire session.
- Average of the two periodic tests/marks of best periodic Test conducted

in the Term is to be taken for consideration.

- Diverse methods of assessment as per the need of the class dynamics and curriculum transaction. These may include - short tests, oral test, quiz, concept maps, projects, posters, presentations, enquiry based scientific investigations etc.

Subject Enrichment in the form of Practical/Laboratory work should be done throughout the year and the student should maintain record of the same. Practical Assessment should be continuous. All practical listed in the syllabus must be completed.

- b. Portfolio to be prepared by the student- This would include class work and other sample of student work.

CLASS X

| EVALUATION SCHEME | | |
|-------------------------------------|---|------------|
| THEORY | | |
| Units | Term - I | Marks |
| I | Chemical Substances-Nature and Behaviour: Chapter 1,2 and 3 | 16 |
| II | World of Living: Chapter 6 | 10 |
| III | Natural Phenomena: Chapter 10 and 11 | 14 |
| Units | Term - II | Marks |
| I | Chemical Substances-Nature and Behaviour: Chapter 4 and 5 | 10 |
| II | World of Living: Chapter 8 and 9 | 13 |
| IV | Effects of Current: Chapter 12 and 13 | 12 |
| V | Natural Resources: Chapter 15 | 05 |
| Total Theory (Term I+II) | | 80 |
| Internal Assessment: Term I | | 10 |
| Internal Assessment: Term II | | 10 |
| Grand Total | | 100 |

UNIT-I:

Chemical reactions and equations: Chemical equation, Balanced chemical equation, implications of a balanced chemical equation.

Light reflection and refraction- Reflection of light by curved surfaces; Images formed by spherical mirrors, center of curvature, principal axis, principal focus, focal length, mirror formula (Derivation not required), magnification.

Practical: Determination of the focal length of:

- i) Concave mirror

ii) Convex lens

By obtaining the image of a distant object.

Life processes: Nutrition in plants and animals, respiration

Practical– Experimentally show that carbon dioxide is given out during respiration.

UNIT-II:

Chemical reactions and equations.

Types of chemical reactions: Combination, decomposition, displacement, double displacement, precipitation, neutralization, oxidation, and reduction.

PRACTICAL: 1. Performing and observing the following reactions and classifying them into:

- a) Combination reaction
- b) Decomposition reaction
- c) Displacement reaction
- d) Double displacement reaction
 - (i) Action of water on quick lime
 - (ii) Action of heat on ferrous sulphate crystals.
 - (iii) Iron nails kept in copper sulphate solution.
 - (iv) Reaction between sodium sulphate and barium chloride solutions

2. Observing the action of Zn, Fe, Cu and Al metals on the following salt solutions:

Unit-I

- i) $\text{ZnSO}_4(\text{aq})$
- ii) $\text{FeSO}_4(\text{aq})$
- iii) $\text{CuSO}_4(\text{aq})$
- iv) $\text{Al}_2(\text{SO}_4)_3(\text{aq})$

Arranging Zn, Fe, Cu and Al (metals) in the decreasing order of reactivity based on the above result.

Light-reflection and refraction--Refraction; Laws of refraction, refractive index.

Refraction of light by spherical lens; Image formed by spherical lenses.

Practical- Tracing the path of a ray of light passing through a rectangular glass slab for different angles of incidence. Measure the angle of incidence, angle of refraction, angle of emergence and interpret the result.

Life processes -- Transportation & excretion in plants and animals

Activity-Diagrams of human digestive, circulatory, respiratory and excretory system.

UNIT-III:

Acids, bases, and salts: Their definitions in terms of furnishing of H^+ and OH^- ions, General properties, examples and uses, concept of pH scale (Definition relating to logarithm not required), importance of pH in everyday life.

PRACTICAL: Finding the pH of the following samples by using pH paper / universal indicator:

- Dilute Hydrochloric Acid
- Dilute NaOH solution
- Dilute Ethanoic Acid Solution
- Lemon juice
- Water
- Dilute Hydrogen Carbonate solution.

Activity-To find parent acid and parent bases of a given salt-worksheet.

Light-reflection and refraction- Lens formula (Derivation not required), Magnification. Power of a lens.

UNIT IV:

Acids, bases, and salts

Preparation and uses of Sodium Hydroxide, bleaching powder, baking soda, Washing soda and Plaster of Paris.

PRACTICAL: Studying the properties of acids and bases (HCl & $NaOH$) by their reaction with:

- Litmus solution (Blue/Red)
- Zinc metal
- Solid sodium carbonate

Human eye and the colourful world- Refraction of light through a prism, dispersion of light.

UNIT V

Metals and nonmetals: Properties of metals and non-metals; Reactivity series; Formation and properties of ionic compounds.

Human eye and the colourful world- scattering of light, applications in daily life.

PRACTICAL- Tracing the path of the rays of light through a glass prism.

TERM -2

UNIT VI

Carbon and its compounds: Covalent bonding in carbon compounds. Versatile nature of carbon. Homologous series.

Electricity - Electric current, potential difference, and electric current. Ohm's law: Resistance, resistivity, Factors on which the resistance of a conductor depends.

PRACTICAL- Studying the dependence of potential difference (V) across a resistor on the current (I) passing through it and determine its resistance. Also plotting a graph between V and I.

How do organisms reproduce: Reproduction in animals and plants (asexual and sexual) reproductive health-need and methods of family planning?

UNIT VII:

Electricity - Series combination of resistors, parallel combination of resistors and its applications in daily life. Heating effect of electric current and its applications in daily life. Electric power, Interrelation between P, V, I and R.

How do organisms reproduce: Safe sex vs HIV/AIDS? Childbearing and women's health.

PRACTICAL - Studying (a) binary fission in Amoeba, and (b) budding in yeast and Hydra with the help of prepared slides.

Periodic classification of elements: Need for classification, early attempts at classification of elements -Dobereiner's Triads,

UNIT VIII:

Magnetic effects of electric current:- Magnetic field, field lines, field due to a current carrying conductor, field due to current carrying coil or solenoid.

Heredity and evolution-Heredity; Mendel's contribution- Laws for inheritance of traits,

Periodic classification of elements: Newland's Law of Octaves, Mendeleev's Periodic Table

UNIT IX

Periodic classification of elements: Modern periodic table, gradation in properties, valency, atomic number.

Magnetic effects of current- Force on current carrying conductor, Fleming's Left-Hand Rule, Electric Motor.

Heredity and evolution - Sex determination: brief introduction

UNIT X

Periodic classification of elements - metallic and non-metallic properties.

Magnetic effects of current- Electromagnetic induction, induced potential difference, Induced current. Fleming's Right Hand Rule.

Our environment: Eco-system, Environmental problems, Ozone depletion, waste production and their solutions. Biodegradable and non-biodegradable, substances.

ONLY FOR INTERNAL ASSESSMENT

Note: Learners are assigned to read the below listed part of Unit V. They can be encouraged to prepare a brief write up on any one concept of this Unit in their Portfolio. This may be an assessment for Internal Assessment and credit may be given (Periodic assessment/Portfolio). This portion of the Unit is not to be assessed in the year-end examination.

Chapter – 16 Management of natural resources: Conservation and judicious use of natural resources. Forest and wildlife; Coal and Petroleum conservation. Examples of people's participation for conservation of natural resources. Big dams: advantages and limitations; alternatives, if any. Water harvesting. Sustainability of natural resources.

PRESCRIBED BOOKS:

- Science-Textbook for class IX-NCERT Publication
- Science-Text book for class X- NCERT Publication
- Assessment of Practical Skills in Science-Class IX - CBSE Publication
- Assessment of Practical Skills in Science- Class X- CBSE Publication
- Laboratory Manual-Science-Class IX, NCERT Publication
- Laboratory Manual-Science-Class X, NCERT Publication
- Exemplar Problems Class IX – NCERT Publication
- Exemplar Problems Class X – NCERT Publication

Assessment Areas (Theory)
2021-22 (Class X)
Science (086)

| Competencies | Marks |
|--|--------------|
| Demonstrate Knowledge and Understanding | 46 % |
| Application of Knowledge/Concepts | 22 % |
| Analyze, Evaluate and Create | 32 % |

Note:

- Internal choice would be provided.

Internal Assessment – Term I and II (10 Marks each)

- **Periodic Assessment** - 03 marks
 - **Multiple Assessment** – 02 marks
 - **Subject Enrichment** (Practical Work) - 03 marks
 - **Portfolio** - 02 marks
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