SHIVALIK PUBLIC SCHOOL

SCIENCE -(SUBJECT CODE - 086)

SYLLABUS FOR PURPOSE OF EXAMINATION 2021-22

CLASAS– IX (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 several 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.

b. 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.

c. Portfolio to be prepared by the student- This would include classwork and other sample

student work.

COURSE STRUCTURE CLASS IX

EVALUATION SCHEME

Theory		
Units	**Term- I (Units 1-5)**	**Marks**
I	Matter-Its Nature and Behaviour: Chapter - 2	**09**
II	Organization in the Living World: Chapter - 5 and 6	**18**
III	Motion, Force and Work: Chapter - 8 and 9	**13**
Units	**Term – II (Units 6-10)**	**Marks**
I	Matter-Its Nature and Behaviour: Chapter 3 and 4	**18**
II	Organization in the Living World: Chapter -13	**08**
III	Motion, Force and Work: 10 and 11	**14**
Total Theory (Term I+II)		**80**
Internal Assessment: Term I		**10**
Internal Assessment: Term II		**10**
Grand Total		**100**

TERM – I

UNIT-I

1. ***Motion***- rest and motion a relative term, describing motion- reference point, motion along a straight line, scalar and vector quantity, distance and displacement, uniform and non-uniform motion, speed and velocity, acceleration
2. ***Fundamental unit of life***-Cell as a basic unit of life; prokaryotic and eukaryotic cells, multicellular organisms; cell membrane and cell wall

Practical

To prepare stained temporary mounts of (a) onion peel and (b) human cheek cells and to record observations

UNIT-II:

1. ***Motion***- graphical representation of motion- distance time and velocity time graphs, equations of motions- graphical method, uniform circular motion
2. ***Fundamental unit of life***-cell organelles; chloroplast, mitochondria, vacuoles, endoplasmic reticulum, Golgi apparatus; nucleus, chromosomes - basic structure, number Cell division - mitosis and meiosis.

UNIT-III:

1. ***Is matter around us pure***-classification of matter- pure substance and mixtures; mixtures- homogeneous and heterogeneous-true solutions, suspensions, and colloid; saturated and unsaturated solutions; concentration of solutions.

   Practical-

   i) Preparation of:

   a) a true solution of common salt, sugar, and alum

   b) a suspension of soil, chalk powder and fine sand in water

   c) a colloidal solution of starch in water and egg albumin/milk in water and distinction between these based on

   - transparency
   - filtration criterion
   - stability

Activity- Prepare types of mixtures and study the properties and do the worksheet in google form.

2. ***Force and laws of motion***-force and its effects; balanced and unbalanced forces, first law of motion-inertia; types of inertia, inertia, and mass.
3. ***Tissues***- Plant tissue- meristematic tissue, simple permanent tissue, complex permanent tissue**.**

   Practical--Identification of Parenchyma, Collenchyma and Sclerenchyma tissues in plants. Drawing their labeled diagrams.

UNIT IV:

1. ***Is matter around us pure***- separation techniques for mixtures-separation of solid from solid- magnetic separation, suitable solvent method, and sublimation; separation of solid from liquid-filtration, evaporation, crystallization, centrifugation, and chromatography
2. ***Force and laws of motion***- second law of motion-momentum, mathematical formula of second law of motion, derivation of first law from the second law of motion, applications of second law of motion in daily life.
3. **Tissue**-Animal tissue- epithelial tissue, connective tissue, muscular tissue, nervous tissue.

   Practical-- Striped, smooth, and cardiac muscle fibers and nerve cells in animals from prepared slides. Drawing their labeled diagrams.

   Activity- Art integration -diagrams of different plant and animal tissue, along with a crossword puzzle.

UNIT V-

1. ***Is matter around us pure***- separation of liquid from liquid- distillation, fractional distillation, separating funnel; separation of various components of air; pure substances- elements and compounds, physical and chemical changes, water purification system.

Activity- Water Auditing and Water Conservation presentation

Practical-

i) Preparation of a mixture and a compound using iron filings and sulphur powder and distinguishing between these based on:
   a) appearance, i.e., homogeneity and heterogeneity
   b) behavior towards a magnet
   c) behavior towards carbon disulphide as a solvent
   d) effect of heat

ii) Performing the following reactions and classifying them as physical or chemical changes:
   a. Iron with copper sulphate solution in water
   b. Burning of magnesium ribbon in air
   c. Zinc with dilute sulphuric acid
   d. Heating of copper sulphate crystals
   e. Sodium sulphate with barium chloride in the form of their solutions in water.

2. Force and laws of motion- third law of motion- recoil velocity; law of conservation of momentum and its mathematical proof. Applications of third law of motion in daily life.

3. Revision- The fundamental unit of life, Tissue

TERM – II

UNIT VI:

1. Atoms and molecules- laws of chemical combinations- law of conservation of mass and law of constant proportion, Dalton's atomic theory-postulates; atoms- symbols of atoms, existence of atoms- molecules and ions

Practical-Verification of the law of conservation of mass in a chemical reaction.

2. Gravitation- centripetal and centrifugal force, universal law of gravitation, importance of universal law of gravitation, free fall acceleration due to gravity

Practical-

Determination of the density of solid (denser than water) by using a spring balance and a measuring cylinder.

3.Why do we fall ill- Health and its failure. Infectious and Non-infectious diseases, their causes and manifestation. Diseases caused by microbes (Virus, Bacteria and Protozoans)

UNIT VII:

1. Atoms and molecules- Writing chemical formulae, atomic mass and molecular mass, formula unit mass.

2. **Gravitation-** motion of object under the influence of gravitational force of earth, mass and weight, weight of object on moon.

Practical Establishing the relation between the loss in weight of a solid when fully immersed in

a) tap water

b) Strongly salty water, with the weight of water displaced by it by taking at least two different solids.

3.Why do we fall ill- Means of spread, Organ specific and tissue specific manifestations

UNIT VIII:

1. Atoms and molecules- Mole concept- relationship of mole to mass of the particles and numbers.

2. Work and energy- work and its scientific concept, positive, negative and zero work. Energy and different forms of energy, interconversions of various forms of energy.

3. *Why do we fall ill-* their prevention; Principles of treatment and prevention. Pulse Polio programs.

UNIT IX

1. ***Structure of atom-***Charged particles in matter- electron, proton and neutron, structure of atom- Thomson's model, Rutherford's model, and Bohr's model of atom
2. ***Work and energy-*** kinetic energy- mathematical formula for kinetic energy.

3.Natural resources- **Only for internal assessment. -** Air, role of atmosphere, winds, rain, Air, Water and Soil pollution (brief introduction)

UNIT X

1. ***Structure of atom-***atomic number, mass number, representation of atom, electronic configuration, valency, formation of cations and anions, isotopes, and Isobars.
2. ***Work and energy-*** potential energy, mathematical formula for potential energy, law of conservation of energy and its mathematical proof.

Activity- Observe the electric meter of your house and take readings everday at 6:00 am in morning and in evening for 7days. Calculate the total energy consumed in the morning and at night during these 7 days..

3.Natural resources- **Only for internal assessment** Bio-geo chemical cycles in nature: Water, Oxygen, Carbon and Nitrogen, greenhouse effect, Holes in ozone layer and the probable damages.

ONLY FOR INTERNAL ASSESSMENT

Note: Learners are assigned to read the below listed part. 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.

Theme: Natural Resources: Balance in nature Unit IV: Our Environment

Physical resources: Air, Water, Soil. Air for respiration, for combustion, for

moderating temperatures; movements of air and its role in bringing rains across India. Air, water, and soil pollution (brief introduction). Holes in ozone layer and the probable damages. Bio-geo chemical cycles in nature: Water, Oxygen, Carbon, Nitrogen.

Activity- Google form will be given to assess this Unit

ASSESSMENT AREAS (THEORY) 2021-22 (CLASS IX) SCIENCE (086)

TIME: 3 HRS.

MAXIMUM MARKS: 80 MARKS

Theory **Total Maximum Marks: 80**

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