**Class -IX**

**Subject :-Science**

**Session : 2023-2024**

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 number of opportunities should be provided to the students to engage them with the processes of Science like observing, recording observations, drawing. tabulation, plotting graphs, 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 temptation of adding too many concepts than can be comfortably learnt in the given time frame. No attempt has been made to becomprehensive.At this stage, while Science is still a common subject, the disciplines of Physics, Chemistry andBiology 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. There will be an Annual Examination based on the entire syllabus.**

**2. The Annual Examination will be of 80 marks and 20 marks weightage shall be for Internal Assessment.**

**3. For Internal Assessment: a There will be Periodic Assessment that would include:**

# For 5 marks- Three periodic tests conducted by the school. Average of the best two teststo be taken that will have a weightage of 05 marks towards the final result.

# For 5 marks-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 and enquiry based scientific investigations etc. and use rubrics for arguing them objectively. This will also have a weightage of 05 marks towards the final result.

# b Practical / Laboratory work should be done throughout the year and the student should maintain record of the same. Practical Assessment should be continuous. There will be weightage of 5 marks towards the final result. All practicals listed in the syllabus must be completed.

# c Portfolio to be prepared by the student- This would include classwork and other sample of student work and will carry a weightage of 5 marks towards the final results

**Examination Scheme**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pen-Paper**  **Test** | **Months** | **Marks** | **Chapter Name** | **Type of Examination** |
| Periodic | July | 20 Marks | School Based | School Based |
| Test-(1) |  |  |  |  |
| Periodic | November | 20 Marks | School Based | School Based |
| Test-(2) |  |  |  |  |
| Periodic | February | 20 Marks | School Based | School Based |
| Test-(3) |  |  |  |  |

**Note :-** First term Examination and Final Examination will be **Centralized (Samiti).**

|  |  |  |
| --- | --- | --- |
| **S.No.** | **Month** | **Activities** |
| 1 | April | * Celebration of Earth Day 22nd April (T-Shirts , Painting, Slogan Writing Poster making etc.) * Pledge on Say No to Single Use Plastics * Save Soil letter to Prime Minister. |
| 2 | May | * Reuse Plastic Waste. |
| 3 | June | **Holiday Homework** |
| 4 | July | * Plantation Drive * Cleanliness Drive (Stagnant Water,Mosquito Breeding Prevention etc.) |
| 5 | August | * Organisation of Health week * Awareness campaign for Corona vaccination project /survey on the status of vaccination in neighbouring area * Presentation (PPT, models, Project Work) |
| 6 | September | * Poster/debate/essay writing/NukkadNatak for Ozone Day |
| 7 | October | Air and Noise Pollution awarenees activities.   * Say No to Crackers (Rally / Speech in Assembly) * Anti Fire Cracker Campaign to reduce Noise pollution. * Essay competition on noise pollution * Debate on Air Pollution (Stop open burning garbage) |
| 8 | November | * Any Visit (Science Museum / Science Centre.   Nehru Planetarium, Mother Dairy Plant ,Biodiversity Park or any other Place |
| 9 | December | * Minimization of plastic packages such as disposables like   thermocol plates, glass, plastic cups etc. |
| 10 | January | * Waste as resource (at school) * Awareness on Yamuna River / Water Conservation. |
| 11 | February | * Contribution of Various Indian Scientists such as : APJ Abdul Kalam, Jagdish Chander Basu or any other Indian Scientist. * Celebration of National Science day (28th February) |
| 12 | March | * Talks/Seminars/Workshop on Water pollution * Khelo Holi Naturally. |

**FIRST TERM**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S.** |  | **Chapter** | **Chapter Name** | **First Term** | **Final Term** |
| **No.** | **Month** | **No.** |  | **Marks** | **Marks** |
|  |  |  |  |  |  |
| 1 | April | 1 | Matter in our surroundings | 13 | 06 |
|  |  |  |  |  |  |
| 2 | May | 5 | The fundamental unit of   Life. | 12 | 10 |
| 3 | July | 15 | Improvement in food Resources | 12 | 06 |
| 4   5.  6 | July  August  August | 8  2  9 | Motion  Is matter around as pure  Force and laws of motion | 15  13  15 | 05  06  05 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  | **Total** | 80 |  |

**FINAL TERM**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S.** | | |  | **Chapter** | **Topics** | | **Final Term** |
| **No.** | | | **Month** | **No.** |  | | **( Marks)** |
| 1. | | | October | 3 | Atoms and Molecules | |  |
| 2. | | | October | 4 | Structure of Atom | | **6**  **6** |
| 3 | | | November | 10 | Gravitation | | **6** |
| 4 | | | December | 6 | Tissues | | **12** |
|  | | |  |  |  | |  |
| 5    6  7 | | | December  January  February | 12  11 | Sound  Work and Energy  Revision of Whole Syllabus | | **6**  **6** |
|  | | |  |  |  | |  |
|  | | |  |  |  | | Total= 80 |
| **TEACHING LEARNING MATERIAL (TLM)** | | | | | | | | | |
| **CLASS : IX** | | | | | | | | | |
|  | |  |  | |  | |  | | |  |
| **S.No.** | | **Ch. No.** | **Chapter Name** | | **Topic** | | **Activity** | **TLM** | |
| 1 | | 1 | Matter in our surroundings | | particles of matter are continuously moving | | Activity 1.3, Activity 1.4, Activity 1.5 | incense stick, match box | |
|  | |  |  | | Sublimation | | Activity 1.13 | camphor and ammonium chloride funnel China dish burner cotton | |
| 2 | | 2 | Is matter around us pure? | | types of mixture | | Activity 2.1 on page 14 NCERT | 4 beakers,copper sulphate, potassium permaganate ,common salt | |
|  | |  |  | | concentration of sol | | Activity 2.3 on page 16 NCERT | water, salt ,sugar , barium chloride | |
|  | |  |  | | separation of component from mixture | | Activity 2.4 separation of dye from blue/black ink | beaker watch glass , burner,water,blue/ black ink | |
|  | |  |  | |  | | Activity 2.5 separation of cream from milk(centrifugation) | milk churner, full cream milk | |
|  | |  |  | |  | | Activity 2.6 separation of two immicible liquids | oil, water, separating funnel | |
|  | |  |  | |  | | Activity 2.7 chromatography | strip of filter paper, pencil,sketch pen/fountain pen,beaker,water | |
| 3 | | 5 | The fundamental unit of life | | temporary mount slides of different cells | | Activity 5.2 | leaf peels, peels of onion, cheek cells,microscope,slide | |
|  | |  |  | | osmosis | | Activity 5.4 | Raisins, apricot, water, salt water | |
| 4 | | 6 | Tissue | | growth of plant occur in certain direction | | Activity 6.1 | beaker,onion,water | |
|  | |  |  | | epidermal cell | | Activity 6.3 | Rhoeo leaf,microscope | |
|  | |  |  | | different types of muscular tissue | | Activity 6.5 | permanent slides of striated , smooth and cardiac muscular tissue | |
| 5 | | 8 | Motion | | odometer instrument | | instrument used for measuring distance of vehicle | odometer | |
|  | |  |  | | speedometer instrument | | instrument used for measuring speed of vehicle | speedometer | |
|  | |  |  | | plotting distance - time graph | | object moving with uniform speed | graph paper, pencil,ruler | |
|  | |  |  | |  | | object moving with non-uniform speed | graph paper, pencil,ruler | |
|  | |  |  | |  | | object at rest | graph paper, pencil,ruler | |
|  | |  |  | | plotting velocity- time graph | | object moving with uniform speed | graph paper, pencil,ruler | |
|  | |  |  | |  | | object moving with uniform acceleration | graph paper, pencil,ruler | |
|  | |  |  | |  | | object moving with non uniform acceleration | graph paper, pencil,ruler | |
|  | |  |  | |  | |  |  | |
| 6 | | 9 | Force and laws of motion | | first law of motion | | Activity 9.2 flicking of card | coin , glass, card | |
|  | |  |  | | Third law of motion | | Activity 9.5 | rubber balloon, adhesive tape straw , thread | |
| 7 | | 3 | Atoms and molecules | | 1)law of conservation of mass | | 3.1 page 31 NCERT | copper sulphate, sodium carbonate, conical flask, cork small ignition tube, thread etc | |
| 8 | | 4 | Structure of the Atom | | 1)Understanding the nature of charged particles | | Activity 4.1 - page 46 NCERT | Comb, dry hair, small pieces of paper, glass road, silk clothes, ballon | |
|  | |  |  | | 2) Make a model of schematic atomic structure of the first eighteen elements | | Activity 4.2 - page 50 NCERT | Drawing paper sheet,compass,pencil,eraser etc. | |
| 10 | | 10 | Gravitation | | 1) A Stone describe a circular path with a velocity of constant magnitude. | | Activity 10.1- Page 131 NCERT | A piece of thread , stone | |
|  | |  |  | | 2) Understanding free fall | | Activity 10.2 -Page 134 NCERT | Stone /tennis ball | |
|  | |  |  | | 3) All object will fall from a height at the same rate | | Activity 10.3 -Page 135 NCERT | Paper sheet and stone | |
| 11 | | 11 | Work and energy | | 1) To understand that work a force can be either positive or negative | | Activity 11.4 -Page 148 NCERT | Any object such as boll, stone , paper sheet, pen. | |
|  | |  |  | | 2) To show kinetic energy of an object due to its motion | | Activity 11.6 Page 160 NCERT | Heavy ball, thick bag of sand | |
|  | |  |  | | 3) To show potential energy of an object | | Activity 11.8 Page 152 NCERT | A rubber band | |
|  | |  |  | | 4) Understand the potential energy of an object | | Activity 11.12 Page 152 NCERT | A bamboo bow, arrow, string | |
| 12 | | 12 | Sound | | 1) Production of sound by | |  |  | |
|  | |  |  | | i) Vibrating tuning fork just touching suspending table tennis ball | | Activity 12.1 Page 160 NCERT | A tuning fork, rubber pad, table tennis ball, thread | |
|  | |  |  | | ii) One or two of the prongs of the vibrating tuning fork touching water surface | | Activity 12.2 Page 160 NCERT | Beaker or glass, water, tuning fork, rubber pad | |
|  | |  |  | | 2) To show sound wave are longitudinal wave | | Activity 12.4 Page 163 NCERT | Slinky, two friends, note book ,pen | |
|  | |  |  | | 3) Reflection of sound | | Activity 12.5 Page 167 NCERT | Two identical pipe, chart paper , clock, pencil, table, white tile, | |
| 15 | | 15 | Improvement in food resources | | Distinguishing b/w weeds and crops | | Activity 15.1 Page 209 NCERT | Garden visit | |
|  | |  |  | | Recognize cereal , pulses, oil seeds | | Activity 15.2 Page 209 NCERT | Seeds of wheat,rice, gram, mustard seeds | |
|  | |  |  | |  | |  |  | |

**Practicals (Term I)**

**(LIST OF EXPERIMENTS)**

1. 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 anddistinguish between these on the basis of

I. transparency

II. filtration criterion

III. stability

2. Preparation of

a) A mixture

b) A compound

using iron filings and sulphur powder and distinguishing between these on the basis of:

(i) appearance, i.e., homogeneity and heterogeneity

(ii) behaviour towards a magnet

(iii) behaviour towards carbon disulphide as a solvent

(iv) effect of heat

3. Perform the following reactions and classify 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

4. Preparation of stained temporary mounts of (a) onion peel, (b) human cheek cells & torecord observations and draw their labelled diagrams.

5. Determination of the melting point of ice and the boiling point of water.

**Practicals (Term II)**

6. Identification of Parenchyma, collenchyma and Sclerenchyma tissues in plants, striped,smooth and cardiac muscle fibers and nerve cells in animals, from prepared slides.

Draw their labelled diagrams.

7. Verification of the Laws of reflection of sound.

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

9. 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 leasttwo different solids.

10. Determination of the speed of a pulse propagated through a stretchedstring/slinky(helical spring).

11. Verification of the law of conservation of mass in a chemical reaction.

**Guidelines for the students**

1. Regular attendance is a must .
2. Maintenance of Copies including practical files.
3. Main focus on reading and writing skills.
4. Try to perform the simple science activities at home to improve your skills under the guidance of your parents.
5. Participate in all the competitions, projects both at School level and in Science Fairs.
6. Try to correlate the learning science with your daily life implementation.
7. Try to be in touch with current affairs related to science news or discoveries and paste the cuttings in a separate copy. Follow all the instructions as per given by the teacher time to time.

8Do physical exercises/ yoga/ meditation every day.

**Guidelines for Parents**.

1 Parents should keep an eye on their ward's attendance.Their ward should attend all the classes and activities with full interest.

2 They should attend all the PTM organised in the school from time to time and have regular communication with teachers regarding their progress learning,home works tests ,assignments etc

3 They should keep an eye on their ward's notebooks.Their classwork and homework should be completed in all respects.

4. They should also encourage their ward to participate in every activities of the school with full enthusiasm.

5. They should also keep an eye on their ward's diet. It should be balanced containing all the nutrients.

6. Notice your ward's good behaviour and point it out ,praising success and good tries.They will get encouraged by this.

**Guidelines for Teachers**

1.The chapter Natural Resources (NCERT Chapter 14) will not be assessed in the year-end examination. However, learners may be assigned to read this chapter and encouraged to prepare a brief write up on any concept of this chapter in their Portfolio. This may be for Internal Assessment and credit may be given for Periodic Assessment/Portfolio.

2.The NCERT text books present information in boxes across the book. These help students to get conceptual clarity. However, the information in these boxes would not be assessed in the year-end examination.