NBSE Class 9 Science Syllabus

SCIENCE

Objectives:

- to understand the basic concepts, principles and laws of science
- to apply basic scientific principles in finding solutions to problems related to agriculture, energy, health, nutrition, etc
- to develop problem- solving and decision- making skills
- to inculcate values that underline the study of science
- to develop and understand various processes of the environment and concern for its conservation and preservation
- to understand and appreciate the joint enterprise of science, technology and society
- to acquire process skills which form part of the attitude for developing a scientific temper
- to develop certain manipulative skills which are required in day-to-day situations
- to develop scientific attitude which will equip them to continue science education throughout life

DESIGN OF QUESTION PAPER
SCIENCE

Weightage to different forms of questions:

Sl. no.	Forms of questions	Marks for each question	No. of questions	Total marks
1.	MCQ	1	10	10
2.	VSA	1	5	5
3.	SA -I	2	5	10
4.	SA -II	3	10	30
5.	LA	5	5	25
	Total		**35**	**80**

Weightage level of questions:

Sl.no.	Level	Percentage	Marks
1.	Easy	25	20
2.	Average	60	48
3.	Difficult	15	12
	Total	**100**	**80**

The expected length of answer and time to be taken under different forms of questions shall be as follows:

Sl.no.	Forms of questions	Expected length of answer	Expected time for each question	Total expected time
1.	Reading	-	-	10 minutes
2.	MCQ	-	2 minutes	20 minutes
3.	VSA	one word/one sentence	2 minutes	10 minutes
4.	SA-I	20-30 words	4 minutes	20 minutes
5.	SA-II	40-60 words	5 minutes	50 minutes
6.	LA	70-100 words	12 minutes	60 minutes
7.	Revision	-	-	10 minutes
			Total time	**180 minutes**

Scheme of options:

There will be no overall choice. However, internal choice shall be provided in:

i. 4 (four) questions of 3 marks each
ii. 4 (four) questions of 5 marks each.

Numericals and diagrams:

i. Weightage of about 5 (five) marks shall be given for numericals.
ii. Weightage of about 8 (eight) marks shall be given for diagrams.

Typology of questions:

In order to assess different abilities related to the subject, the question paper shall include open-ended questions; drawing/illustrations based questions and questions testing higher order thinking skills of the learners.

Class – IX
SCIENCE

Unit-wise weightage
Part 'A' External **Time: 3 hours** **Marks: 80**

Unit		Marks
I	Matters –Nature and Behaviour	20
II	Organisation in the living world	16
III	Motion, Force, Work and Sound	23
IV	Health and Diseases	9
V	Natural Resources	12
	Total	80
Part 'B' Internal		20
	Grand Total :	100

PART – A : EXTERNAL **80 marks/180 periods**

Unit I : Matter – Nature and Behaviour

1. Matter in Our Surroundings
2. Is Matter Around Us Pure ? — 9 marks/23 periods

3. Atoms and Molecules
4. Structure of the Atom — 11 marks/27 periods

Unit II : Organisation in the Living World

5. The Fundamental Unit of life
6. Tissues
7. Diversity in Living Organisms — 16 marks/36 periods

Unit III : Motion, Force, Work and Sound

8. Motion
9. Force and Laws of Motion
10. Gravitation — 13 marks/34 periods

11. Work and Energy
12. Sound — 10 marks/24 periods

Unit IV : Health and Diseases

13. Why do we Fall ill - 9 marks/10 periods

Unit V : Natural Resources

13. Natural Resources
14. Improvement in Food Resources — 12 marks/26 periods

PART- B : INTERNAL - **20 Marks**

Unit-I : Matter – Nature and Behaviour

1. *Matter in Our Surroundings*: Physical nature of matter, characteristics of particles of matter, States of Matter, Change of State, Evaporation.
2. *Is Matter Around us Pure*: Mixtures, types of mixtures, solution, suspension and colloid, separation of components of a mixture, elements, compounds.
3. *Atoms and Molecules*: Laws of Chemical Combination, Atoms, atomic mass, molecules, writing chemical formulae, formulae of simple compounds, molecular mass and mole concept.
4. *Structure of the Atom*: Structure of an Atom, distribution of elections in shells, valency, atomic number and mass number, Isotopes, Isobars.

Unit-II : Organisation in the Living World

5. *The Fundamental unit of Life*: Structural Organisation of a Cell, Cell organelles and functions.
6. *Tissues*: Plant tissues- structure and functions (meristematic and permanent tissues), animal tissues- structure and functions (epithelial, connective, muscular and nervous tissues).
7. *Diversity in Living Organisms*: General idea of classification, classification with characteristics and examples in plants and animals.

Unit-III : Motion, Force, Work and Sound

8. *Motion:* Motion- along a straight line, uniform and non-uniform motion, rate of motion, rate of change of velocity, graphical representation of motion, distance- time graphs, velocity-time graphs, derivation of equations of motion by graphical method, uniform circular motion.
9. *Force and laws of Motion*: Motion- First law of Motion, Inertia and mass, Second Law of Motion, Third Law of Motion, Conservation of Momentum.
10. *Gravitation:* Gravitation, Universal law of Gravitation, Free fall, acceleration due to gravity, mass, weight, thrust and pressure, buoyancy, Archimedes' Principle, Relative density.
11. *Work and Energy*: Work-concept, work done by a constant force, energy- kinetic and potential energy, law of conservation of energy, rate of doing work, commercial unit of energy.
12. *Sound:* Sound- production and propagation of sound, sound waves- characteristics, speed of sound, reflection of sound, echo, range of hearing, applications of ultrasound, SONAR, structure of human ear (auditory aspect only).

Unit-IV : Health and Diseases

13. *Why do we fall ill*: Health and its importance, personal and community health, disease and its causes, acute and chronic, communicable and non-communicable diseases, agents, means of spread, symptoms, treatment and prevention.

Unit-V : Natural Resources

14. *Natural Resources:* Resources- Air, water, soil, minerals, Biogeochemical cycles- water cycle, Nitrogen cycle, carbon cycle, oxygen cycle, Greenhouse effect, Ozone layer.
15. *Improvement in Food Resources*: Food resources- Improvement in crop yields, crop variety improvement, crop production management- nutrient management, manure, fertilizers, crop protection management, Animal husbandry- cattle farming, poultry farming, egg and boiler production, fish production, bee-keeping.

PART – B: INTERNAL **20 marks**

Area of Assessment	Marks
1. Experiments/Activities	10
2. Records	5
3. Formal Test	5
Total	20

Experiments and activities should be conducted alongside the concepts taught in theory classes. The students should be assessed on a continuous and comprehensive basis. The role of a teacher assumes a very significant part, as such, they are expected to be fair and assess the performance of the students without any bias.

A student is expected to perform and record at least 3 experiments and 2 activities in each period of assessment from the list suggested below. Thus, a student shall perform a total of at least 6 (six) experiments and 4 (four) activities, at least one from each unit, throughout the academic year.

List of Experiments :

- **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.

- **Motion, Force and Work**
  - To determine the density of a liquid (other than water) by using a spring balance and a measuring cylinder.
  - To determine the density of a solid (denser than water) by using a spring balance and a measuring cylinder.
  - To determine the value of acceleration due to gravity.
  - To verify Archimedes' Principle.
  - To determine the boiling point of water and melting point of a solid (ice, urea).
  - To determine the velocity of a pulse propagated through a stretched string/sling.

- **Organisation in the Living World**
  - To prepare temporary mount of onion peel, human cheek cells and spirogyra, to identify their parts and draw labelled diagrams.
  - To identify different plant tissues (parenchyma, collenchyma, sclerenchyma) and animal tissues (striated muscle, nerve, blood) from prepared slides and draw their labelled diagrams.
  - To collect and identify different plant and animal specimens.
  - To study the characteristics of *Spirogyra*/ *Agaricus*, Moss/ Fern, *Pinus* (either with male or female) and an Angiosperm plant. Draw and give two identifying features of groups they belong to.
  - To observe and draw the given specimens- earthworm, cockroach, bony fish and bird. For each specimen, record- (a) one specific feature of its phylum (b) one adaptive feature with reference to its habitat.

- **Nutrition and Health**
  - To collect articles in the local newspaper regarding nutrition and health.

- **Natural resources and Environment**
  - To make a herbarium of cereals, pulses and oil seeds and identify the seasons of their sowing and harvesting.
  - To visit a local poultry farm/ fish farm/ apiary/ mushroom cultivation/ piggery/ paddy field. Observe the different types of breeds/ fish/paddy/ etc.
  - To study the external structural adaptations of any two in aspect of their terrestrial (cockroach) aquatic (fish, prawn) amphibious (toad, frog) reptilians (lizards, chameleons), aerial (birds) and burrowing (mole, rat, earthworm) features.

List of Activities:

- Group/Individual Assignments
- Information gathering and deducing
- Discussion and debate
- Science symposium/seminar
- Presentation on science concepts/experiments
- Model making
- Field Trip

Prescribed textbook:

Science Class IX	***- NCERT Textbook (Nagaland edition)*** ***Printed & distributed by Evergreen Publications***
Science Laboratory Manual Class IX	***- Evergreen Publications (I) Ltd.*** ***4738/23, Ansari Road Daryaganj*** ***New Delhi-110002***