CBSE CLASS IX

SCIENCE

(Marks: 80)

Unit no.	Unit	Marks
I	Matter - Its Nature and Behaviour	23
II	Organisation in the Living World	20
III	Motion, Force and Work	27
IV	Our Environment	06
V	Food; Food Production	04
	TOTAL	**80**
	Internal assessment	20
	Grand Total	**100**

Note : Above weightage includes the weightage of questions based on practical skills.

Theme: Materials (50 Periods)

Unit I: Matter-Nature and Behaviour

Definition of matter; solid, liquid and gas; characteristics - shape, volume, density; change of state-melting (absorption of heat), freezing, evaporation (cooling by evaporation), condensation, sublimation.

Nature of matter : Elements, compounds and mixtures. Heterogeneous and homogenous mixtures, colloids and suspensions.

Particle nature, basic units : Atoms and molecules. Law of constant proportions. Atomic and molecular masses.

Mole Concept : Relationship of mole to mass of the particles and numbers. Valency.

Structure of atom: Electrons, protons and neutrons, valency, chemical formula of common compounds. Isotopes and Isobars.

Theme: The World of the Living (45 Periods)

Unit II: Organization in the Living World

Cell - Basic Unit of life : Cell as a basic unit of life; prokaryotic and eukaryotic cells, multicellular organisms; cell membrane and cell wall, cell organelles and cell inclusions; chloroplast, mitochondria, vacuoles, endoplasmic reticulum, Golgi apparatus; nucleus, chromosomes - basic structure, number.

Tissues, Organs, Organ System, Organism: Structure and functions of animal and plant tissues (only four types of tissues in animals; Meristematic and Permanent tissues in plants).

Biological Diversity : Diversity of plants and animals - basic issues in scientifc naming, basis of classifcation. Hierarchy of categories / groups, Major groups64 of plants (salient features) (Bacteria, Thallophyta, Bryophyta, Pteridophyta, Gymnosperms and Angiosperms). Major groups of animals (salient features) (Nonchordates upto phyla and chordates upto classes).

Health and Diseases : Health and its failure. Infectious and Non-infectious diseases, their causes and manifestation. Diseases caused by microbes (Virus, Bacteria and Protozoans) and their prevention; Principles of treatment and prevention. Pulse Polio programmes

Theme: Moving Things, People and Ideas (60 Periods)

Unit III: Motion, Force and Work

Motion : Distance and displacement, velocity; uniform and non-uniform motion along a straight line; acceleration, distance-time and velocity-time graphs for uniform motion and uniformly accelerated motion, derivation of equations of motion by graphical method; elementary idea of uniform circular motion.
Force and Newton's laws : Force and Motion, Newton's Laws of Motion, Action

and reaction forces, Inertia of a body, Inertia and mass, Momentum, Force and Acceleration. Elementary idea of conservation of Momentum.

Gravitation : Gravitation; Universal Law of Gravitation, Force of Gravitation of the earth (gravity), Acceleration due to Gravity; Mass and Weight; Free fall.

Floatation : Thrust and Pressure. Archimedes' Principle; Buoyancy; Elementary Idea of Relative Density.

Work, energy and power : Work done by a Force, Energy, Power; Kinetic and Potential energy; Law of conservation of energy.

Sound : Nature of sound and its propagation in various media, speed of sound, range of hearing in humans; ultrasound; reflection of sound; echo and SONAR. Structure of the Human Ear (Auditory aspect only)

Theme : Natural Resources : Balance in Nature

Unit IV : Our Environment (15 Periods)

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 and Nitrogen.

Theme: Food (10 Periods)

Unit V: Food Production

Plant and animal breeding and selection for quality improvement and management; Use of fertilizers and manures; Protection from pests and diseases; Organic farming.

PRACTICALS (30 Periods)

Practicals should be conducted alongside the concepts taught in theory classes.

(LIST OF EXPERIMENTS)

1. Preparation of :

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

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

c) a colloidal solution of starch in water and egg albumin/milk in water and

distinction between these on the basis of

- transparency
- fltration criterion
- stability

2. Preparation of

a) a mixture

b) a compound

using iron flings and sulphur powder and distinction 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. Separation of the components of a mixture of sand, common salt and ammonium chloride (or camphor).

4. 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.

5. Preparation of stained temporary mounts of (a) onion peel, (b) human cheek cells & to record observations and draw their labeled diagrams.

6. Identifcation of Parenchyma, Collenchyma and Sclerenchyma tissues in plants, striped, smooth and cardiac muscle fbers and nerve cells in animals from prepared slides. Drawing of their labeled diagrams.

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

8. Verifcation of the Laws of reflection of sound.

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

10. 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.
11. Determination of the speed of a pulse propagated through a stretched string / slinky.
12. Study of the characteristics of Spirogyra / Agaricus, Moss / Fern, Pinus (either with male or female cone) and an Angiospermic plant. Drawing and providing two identifying features of the groups they belong to.
13. Observing the given pictures / charts / models of earthworm, cockroach, bony fsh and bird. For each organism, drawing of their picture and recording :
a) one specifc feature of its phylum.
b) one adaptive feature with reference to its habitat.
14. Verifcation of the law of conservation of mass in a chemical reaction.
15. Study of the external features of root, stem, leaf and flower of monocot and dicot plants.

QUESTION PAPER DESIGN FOR SCIENCE (CODE NO. 086/090)
Class-IX

Science (Time: 3 Hours)

Marks: 80

1. Remembering (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories, Identify, define or recite, information)
VSA (1 Mark) = 2
SA-I (2 Marks) = 0
SA-II (3 Marks) = 1
LA (5 Marks) = 1
Total Marks = 10
% Weightage = 15%

2. Understanding (Comprehension - to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)

VSA (1 Mark) = 0
SA-I (2 Marks) =1
SA-II (3 Marks) =4
LA (5 Marks) =2
Total Marks = 24
% Weightage = 35%

3. Application: (Use abstract information in concrete situation, to apply knowledge to new situations, use given content to interpret a situation, provide an example, or solve a problem
VSA (1 Mark) = 0
SA-I (2 Marks) =1
SA-II (3 Marks) =2
LA (5 Marks) =2
Total Marks = 18
% Weightage = 26%

4.High Order Thinking Skills: (Analysis & Synthesis - Classify, compare, contrast, or differentiate between different pieces of information, Organize and/or integrate unique pieces of information from a variety of sources)
VSA (1 Mark) = 0
SA-I (2 Marks) =0
SA-II (3 Marks) =1
LA (5 Marks) =1
Total Marks = 8
% Weightage = 12%

5.Inferential and Evaluative: (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)
VSA (1 Mark) = 0
SA-I (2 Marks) =1
SA-II (3 Marks) =1+1*
LA (5 Marks) =0
Total Marks = 8
% Weightage = 12%

6.Total (Theory Based Questions)

VSA (1 Mark) = 2x1=3

SA-I (2 Marks) = 3x2=6

SA-II (3 Marks) = 10x3=30

LA (5 Marks) = 6x5=30

Total Marks = 68(21)

% Weightage = 100%

Practical Based Questions (PBQs)

SA-I (2 Marks) = 6x2=12

Total Marks = 12(6)

Total

VSA (1 Mark) = 2x1=2

SA-I (2 Marks) = 9x2=18

SA-II (3 Marks) = 10x3=30

LA (5 Marks) = 6x5=30

Total Marks = 80(27)

1. Question paper will consist of 27 questions.
2. All questions would be compulsory. However, an internal choice will be provided in two questions of 3 marks each and one question of fve marks.

*One question of 3 marks will be included to assess the values inherent in the texts.