

SCIENCE AND TECHNOLOGY

9th Class

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 esthetic sensibility.

Upper primary stage demands that number of opportunities should be provided to the students to engage them with the processes of science like observing, recording observation, drawing, tabulation, plotting graphs etc., where as 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 via, 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 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.

Courses of Study

- 1 MATTER IN OUR SURROUNDINGS
- 2 IS MATTER AROUND US PURE?
- 3 ATOMS AND MOLECULES
- 4 STRUCTURE OF THE ATOM
- 5 THE FUNDAMENTAL UNIT OF LIFE
- 6 TISSUES
- 7 MOTION
- 8 FORCE AND LAWS OF MOTION
- 9 GRAVITATION
- 10 WORK AND ENERGY
- 11 SOUND
- 12 IMPROVEMENT IN FOOD RESOURCES

Unit No.	Unit	Chapters Covered
I	Matter- Its nature and behaviour	1. Matter in our Surroundings 2. Is Matter around us pure 3. Atoms and Molecules 4. Structure of the Atom
II	Organization in living World	5. The Fundamental Unit of Life 6. Tissues
III	Motion, Force, Work & Energy	7. Motion 8. Force & Laws of Motion 9. Gravitation 10. Work and Energy 11. Sound
IV	Food, Food production	12. Improvement in Food Resources

Unit-I Matter – Nature and Behaviour

Questions	Marks
4 Questions (MCQ)	4 Marks
1 Question (Assertion-reason)	1 Mark
3 Questions (Very short answer)	6 Marks
1 Question (Short answer)	3 Marks
1 Question (long answer)	5 Marks
10 Questions	19 Marks

Chapter-1 Matter in our surroundings:-

Physical Nature of Matter, Characteristics of particles of Matter, states of matter, can matter change its state?, Evaporation

Chapter-2: Is Matter around us pure:-

What is a mixture?, Solution, Physical and Chemical Changes, Types of Pure Substances.

Chapter-3: Atom and Molecules :-

Laws of Chemical Combination, Atoms, Molecules, Ion, Writing Chemical Formulae

Chapter-4: Structure of the Atom:-

Charged Particles in Matter, The Structure of an Atom, Distribution of Electrons in orbits, Valency, Atomic Number and Mass Number, Isotopes and Isobars

Unit-II: Organization in Living World.

Questions	Marks
3 Questions(MCQ)	03 Marks
1 Question (Assertion-reason)	1 Mark
1 Question(Very short answers)	02 Marks
1 Question (Short answer)	03 Marks
1 Question (Long answer)	05 Marks
7 Questions	14 Marks

Chapter-5: The Fundamental Unit of Life:-

What are living organism made up of?, Structural organization of a cell, cell division.

Chapter-6: Tissues:-

Plant Tissues- meristematic and permanent tissues

Animal Tissues- Epithelial Tissue, Connective tissue, Muscular tissue and Nervous tissue.

Unit-III : Motion, Force, Work & Energy

Questions	Marks
4 Questions (MCQ)	4 Marks
1 Question (Assertion-reason)	1 Mark
3 Questions (Very short answer)	6 Marks
2 Question (Short answer)	6 Marks
1 Question (Long answer)	5 Marks
11 Questions	22 Marks

- Chapter-7: Motion:-
Describing motion, Measuring the rate of motion, Rate of Change of velocity, Graphical representation of Motion, Equations of Motion.
- Chapter-8: Force and Laws of Motion :-
Balanced and unbalanced forces, First law of motion, Second Law of Motion, Third law of Motion.
- Chapter-9: Gravitation:-
Universal law of Gravitation, Free fall, Mass, Weight, Thrust and Pressure, Archimedes' principle.
- Chapter -10: Work and Energy: -
Work, Energy, Forms of Energy, Law of Conservation of Energy, Rate of doing work
- Chapter -11: Sound: -
Production of Sound, Characteristics of Sound wave, Reflection of Sound, Range of Hearing, Applications of ultrasound.

Unit IV : Food, Food Production

Questions	Marks
1 Question(MCQ)	1 Mark
2 Questions(Very Short Answer)	4 Marks
3 Questions	5 Marks

- Chapter-12: Improvement in Food Resources:-
Improvement in crop fields, Animal Husbandry-Cattle farming, poultry Farming, Fish Production and Bee-keeping.

Practical Syllabus

20 Marks

Chemistry

- How to prepare and identify a Homogenous and Heterogeneous mixture.
- To separate a mixture of two immiscible liquids with the help of separating funnel.
- How will you study the process of sublimation?
- To prove experimentally that the temperature remain same during the change of state of solid ice into liquid water.
- Identify the various apparatus of laboratory and study their uses.

Physics

- To prove the Newton's Third Law of Motion with the help of balloon and straw.
- To verify Archimedes Principle with the help of spring balance and stone.
- To find the value of final velocity 'v' of an object by using formula $v=u+at$.
- To study the motion of transverse wave and longitudinal wave.

Biology

- To prepare a temporary slide of Onion Peel.
- To study the parts of Compound Microscope and their function.
- To study permanent slide of Bacterium and Euglena.
- Prove experimentally the top soil which is base of vegetation is likely to be removed very quickly than the top soil with vegetation.

ASSIGNMENT/PROJECT/MODELS

CHEMISTRY

1. Static Model of electron distribution of an atom.
2. Model of Water Treatment Plant.
3. Different types of human body cell.
4. Animal Cell and Plant Cell.
5. Different type of Plant tissue/Animal tissue.
6. Prepare the Herbarium sheet.

Prescribed Books :

1. **Vigyan** Published by H.P. Board of School Education.
2. **Science** Published by H.P. Board of School Education.