

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

Unit No.	Unit	Chapters Covered
I	Chemical Substances Nature and behaviour.	Chapter- 1: Chemical reaction and equations. Chapter-2: Acids, Bases and Salts Chapter-3: Metals and Non-Metals Chapter-4: Carbon and its compounds.
II	Work of living	Chapter- 5: Life processes Chapter-6: Control and coordination Chapter-7: How to organisms reproduce? Chapter-8: Heredity.
III	Natural Phenomena and effects of current	Chapter- 9: Light-Reflection and refraction. Chapter-10: The human eye and the colourful world. Chapter-11: Electricity Chapter-12: Magnetic effects of electric current.
IV	Natural Resources	Chapter-13: Our Environment

Unit-I Chemical Substances, 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 chemical reactions and equation:-

Chemical equations, balanced chemical equation, types of chemical equations-combination. Decomposition, displacement double displacement, precipitation, endothermic, exothermic and redox(oxidation-reduction)reactions. Effect of oxidation and reduction reactions in everyday life- corrosion and rancidity.

Chapter-2: Acid, bases and salts:-

Chemical properties of acids and bases, concept of pH scale, Importance of pH in everyday life, Chemicals from common salt, Preparation and uses of Sodium Hydroxide, Bleaching powder, Baking soda, Washing soda and plaster of Paris. Concept of water of crystallisation.

Chapter-3: Metals and Non-Metals :-

Physical and chemical properties of metals and Non-Metals. Reactivity series. Formation and properties of ionic compounds, Basic metallurgical process, corrosion and its prevention.

Chapter-4: Carbon- compounds:-

Covalent bonding, Versatile nature of carbon, Saturated and Unsaturated. Carbon compounds, Nomenclature of carbon compounds, Chemical properties of carbon compounds, Ethanol and Ethanoic acid (properties and uses), Soaps and detergents, Cleaning action of soaps (Micelles formation).

Unit-II: World of Living.

Questions	Marks
4 Questions(MCQ)	04 Marks
1 Question (Assertion-reason)	01 Mark
3 Questions(Very short answers)	06 Marks
1 Question (Short answer)	03 Marks
1 Question (Long answer)	05 Marks
10 Questions	19 Marks

Chapter-5: Life processes:-

Living being. Basic concept of Nutrition. Respiration, Transportation and excretion in Human-beings and Plants.

Chapter-6: Control and Coordination:-

Animal's nervous system, Reflex action, Human Brain, Coordination in plants, Tropic movements in plants, Plant hormones, Hormones in animals.

Chapter-7: How do organisms Reproduce? :-

Different modes of reproduction in plants and animals, Importance of sexual-reproduction, Sexual Reproduction in plants, Reproduction in Human beings, Reproductive Health, Different methods of family planning.

Chapter-8: Heredity :-

Accumulation of variation during reproduction, Heredity, Mendel's contributions rules for inheritance of traits. How do the traits get expressed? Sex determination.

Unit-III : Natural Phenomena and effects of current

Questions	Marks
3 Questions (MCQ)	3 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
9 Questions	18 Marks

- Chapter-9: Light-Reflection and refraction:-
Reflection of light spherical mirrors:- concave and convex, Representation of images formed by mirrors using ray diagrams mirror formula and magnification, refraction of light through glass slab and lenses, Image formation by lenses, Lens formula and magnification, uses of mirrors and lenses power of lens.
- Chapter-10: The Human Eye and the colourful world :-
The human Eye, Power of accommodation, defects of vision and their correction, Refraction of light through prism, Dispersion of light, atmosphere Refraction ,Scattering of light.
- Chapter-11: Electricity:-
Electric current, electric potential and potential difference, Circuit diagram, Ohm's law, Factors on which the resistance of a conductor depends, Series combination of resistors. Parallel combination of resistors, Heating effects of electric current and its practical applications, Electric Power.
- Chapter -12: Magnetic effect of electric current: -
Magnetic field and field lines, Magnetic field due to a current carrying conductor right hand thumb rule, Magnetic field due to a current carrying conductor in a magnetic field, Fleming's left hand rule, Domestic Electric circuits.

Unit IV : Natural Resources

Questions	Marks
1 Question(MCQ)	1 Mark
1 Question(Short Answer)	3 Marks
2 Questions	04 Marks

- Chapter-13: Our Environment:-
Eco-System, Food Chains and webs, Ozone layer and its depletion, Managing the garbage we produce, Biodegradable and non-biodegradable substances.

**PRACTICAL
LIST OF EXPERIMENTS**

Marks: 20

PHYSICS

- To determine the focal length of
1(A) Concave mirror
1(B) Convex mirror
by obtaining the image of a distant object.
- To trace the path of a ray of light passing through a rectangle glass slab for different angles of incidence. Measure the angle of incidence, angle of reflection, angle of emergence and interpret the result.
- To study the dependence of current (I) on the potential difference (V) across a resistor and determine its resistance. Also plot a graph between V and I.
- To determine the equivalent resistance of two resistors when connected in series.
- To determine the equivalent resistance of two resistors when connected in parallel.

CHEMISTRY

6. To find the pH of the following samples by using pH paper/universal indicator.
 - (i) Dilute Hydrochloride solution.
 - (ii) Dilute NaOH solution.
 - (iii) Dilute Ethanoic acid solution.
 - (iv) Lemon juice.
 - (v) Water.
 - (vi) Dilute Sodium Bicarbonate solution.
7. To study the properties of acids and bases (HCL & NaOH) by their reaction with
 - (i) Litmus solution (Blue/Red)
 - (ii) Zinc Metal
 - (iii) Solid Sodium Carbonate
8. (a) To observe the action of Zn, Fe, Cu and Al metals on the following salt solutions.
 - (i) $\text{ZnSO}_4(\text{aq})$
 - (ii) $\text{FeSO}_4(\text{aq})$
 - (iii) $\text{CuSO}_4(\text{aq})$
 - (iv) $\text{Al}_2(\text{SO}_4)_3(\text{aq})$(b) Arrange Zn, Fe, Cu and Al metals in the decreasing order of their reactivity based on the above result.
9. To study the following properties of Acetic acid (Ethanoic acid).
 - (i) Odour
 - (ii) Solubility in water
 - (iii) Effect on litmus
 - (iv) Reaction with Sodium bicarbonate

BIOLOGY

10. To prepare a temporary mount of a leaf peel to show stomata.
11. To show experimentally that carbon dioxide is given out during respiration.
12. To show experimentally that light is necessary for photosynthesis.
13. To study (a) binary fission in Amoeba and (b) budding in yeast with the help of prepared slides.
14. To determine the percentage of water absorbed by Raisins.

Prescribed Books :

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