

Science

Classes – IX and X

Introduction

Science & technology has made a profound impact on society as a whole. The rate of advancement in science & technology is so high that one needs to have a re-look at strategies to cope with this change and to be able to contribute towards the growth of new knowledge and its applications. The young students have to be prepared to face the challenges of a shrinking world, technology dependent human life and fast growing scientific base. Children have to be inspired to be the future leaders who would make fundamental contributions. This is the inherent spirit in which the curriculum have been revised for secondary level.

The proposed syllabus for science at secondary stage has been developed as per guidelines of NCF-2005. Due care has been taken that the syllabus is not heavy and at the same time it is comparable to national standards. It is expected that the syllabus will help to develop interest in learner to study science. Different activities have been proposed to help them to learn the content effectively. There has to be adequate time for carrying out activities which should be followed by discussions. Various components of science has been integrated imaginatively in the syllabus. Some important feature of syllabus in the light of NCF-2005 are:

- 1) Spirit of learning with out burden.
- 2) Connecting knowledge to life outside the school.
- 3) Content according to the mental level of children of respective classes.
- 4) To provide various life experiences to make ideas more interesting and careful.
- 5) To ensure the active participation of each child in developing the knowledge and understanding concepts.
- 6) Overall development of children e.g., appropriateness of topic and themes for the relevant stages of children development from a psychological point of view.
- 7) Continuity from one level to the next i.e., known to unknown and simple to complex.

The entire primary and secondary school curriculum should have horizontal integration and vertical continuity. Syllabus from primary to secondary stage have been designed under seven major themes viz., Food, Materials, The world of living, People & ideas, How things work, Natural phenomena and Natural resources. However science up to class X have to be learnt as a composite subject and not a separate disciplines such as Physics, Chemistry and Biology.

Objectives

The proposed syllabus for science at secondary stage has been framed to achieve the following objectives:

- To develop understanding based on observation, identification, classification and illustrations drawn from life experiences of the physical, biological & cultural aspect of life.
- To help acquire the knowledge, understanding attitude, competence and skills to explore the principles of science and its application consistent with the stages of cognitive development.
- To develop curiosity in the young minds to discover the laws of nature and to develop scientific temper.
- To understand relationship between nature and matter on scientific basic and appreciate quality of life.
- To understand the nature of science and technology and their interdependence.
- To develop a sense of belonging-ness to the environment (physical and social, natural and man-made, local and global) and appreciate the issues at the interface of science, technology and society.
- To develop problem-solving aptitude and skills.
- To develop a rich and holistic view of the universe.
- To help learner enjoy science through examples from daily life.

Expected Outcome

After the completion of secondary stage the student will develop understanding based on observation, illustration and experimentation. He/she will be able to learn science by working with hands and tools to design more advanced technological molecules than at the upper primary stage. Scientific vocabulary of the student expands and scientific temper is inculcated. He/she will be able to understand the basic concepts, principles and laws of science. Problem solving and inference making skills will be developed. He/she will develop analytical skills and will be able to apply the gained knowledge in understanding new and novel situations. The learner will enjoy to learn difficult topics with examples from everyday life.

The students will be able to understand the nature of science and Technology and how they have become inseparable and complementary to each other. He/she will be able to understand the basic concepts, principles and laws

of science. The child will be able to think critically and apply the gained knowledge in solving difficulties through examples by doing practically to some extent. He/she will have basic idea about atoms, molecules, symbols, formulae and periodic table and basic metallurgical process, metals/non-metals importance of carbon compounds, hydrocarbons, importance of chemical compounds, chemical text and how they are formed.

He/she will have basic idea about cell organelles, tissues, various systems, food, health and diseases and natural resources.

The learner will understand light as a natural phenomenon and will be able to understand many equipments and naturally occurring events as consequence of laws of reflection and refraction of light, etc.

They will also understand working of many devices which are based on electricity and magnetic effects of electric current. They will also have definite ideas about many sources of energy.

Evaluation for secondary stage

The following evaluation pattern should be followed for the secondary stage :

1. Recapitulation : Daily revision of the previously taught subject matter in the class.
2. Periodic Tests should be given after the completion of each topic.
3. Regular Home assignments should be given from time to time.
4. Written Examination system should be in terminal form i.e.
 - ❖ 1st terminals will cover 40% of the syllabus
 - ❖ 2nd terminals will cover 80% of the syllabus
 - ❖ Annual Examinations will cover the whole syllabus.

One practical should be performed in a week for class X.

Distribution of Marks

Practical exercise **20 Marks**

Break up of marks for each exercise

A.) I	Setting/ handling of the apparatus	04
II	Observation/ identification	04
III	Calculation/result	04
IV	Interpretation	04
V	Viva-voce (Principle, Formula, Procedure application of acquired knowledge and precautions)	04
Total		20 Marks

B) Practical Period :

1.	Indexing	01
2.	Recording of experiments in proper way	02
3.	Regularity in submitting	01
4.	Neatness	01
Total		05 Marks

Total of (A) and (B) 25 marks

Note: If there is no scope for evaluation of any parameter of the assignment experiment, its equivalent marks may be distributed over other appropriate parameters.

Class - X

Chemistry (Practical)

I. Some important chemical Reactions :

- a. To find the ph of given samples (4-5) of solutions/ fruit juices using ph paper.
- b. To carry out the reactions of an acid (HCl) using litmus solution - (blue and red) with Zn metal, Na_2CO_3 and Na OH.
- c. To carryout the reactions of a base (NaOH) using litmus solution - (blue and red) with Al metal and HCl.

II. Natural Resources

1. To show rusting of iron and identify the conditions for rusting.
2. To study the interaction of metals (any four) with their salt solutions and arrange them according to their reactivity Mg, Zn, Fe, Sn, Cu and Al.
3. To study any two physical and two chemical properties of acetic acid.
4. To compare the foaming capacity of diff. samples of soap (at least three samples).
5. To study the comparative cleansing capacity of a sample of soap in soft water and hard water.
6. To prepare soap by cold process.
7. To prepare saturated solution of sugar and common salt.

Class - X

Physics (Practical)

Unit- Measurement

- ❖ To measure the internal diameter of tumbler using vernier callipers.
- ❖ To measure the diameter of knitting needle by using screw gauge.

Unit-Light

- ❖ To verify the laws of reflection using plane mirror.
- ❖ To trace the path of ray of light passing through a rectangular glass slab and measure the angle of incidence and angle of emergence.
- ❖ To measure the angles of deviation at different angles of incidence by tracing the path of rays of light through prism.

Unit – Electricity

- ❖ To verify Ohm's law
- ❖ To verify the laws of combination of resistances (in series and parallel) Ohm's law.

Unit – Wave motion

- ❖ To determine period of a simple pendulum by using stop watch.

Class - X **Biology (Practical)**

The world of living

1. To prepare temporary mount of a (i) leaf and (ii) peel to show its stomata.
2. To study binary fission and budding with the help of prepared slides.
3. To study ascent of sap in balsam.
4. To show that light is necessary for photosynthesis.
5. To show that oxygen evolves during photosynthesis.
6. To show that carbon dioxide is produced during respiration.
7. To show transpiration in plants.
8. To study the cell division in the prepared slides.
9. To show that starch is produced during photosynthesis.
10. Identification/classification of some of the common plants and animals.