SCIENCE AND TECHNOLOGY

STANDARD TEN

PART – 2

The Constitution of India

Chapter IV A

Fundamental Duties

ARTICLE 51A

Fundamental Duties- It shall be the duty of every citizen of India–

(a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

(b) to cherish and follow the noble ideals which inspired our national struggle for freedom;

(c) to uphold and protect the sovereignty, unity and integrity of India;

(d) to defend the country and render national service when called upon to do so;

(e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities, to renounce practices derogatory to the dignity of women;

(f) to value and preserve the rich heritage of our composite culture;

(g) to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures;

(h) to develop the scientific temper, humanism and the spirit of inquiry and reform;

(i) to safeguard public property and to abjure violence;

(j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement;

(k) who is a parent or guardian to provide opportunities for education to his child or, as the case may be, ward between the age of six and fourteen years.

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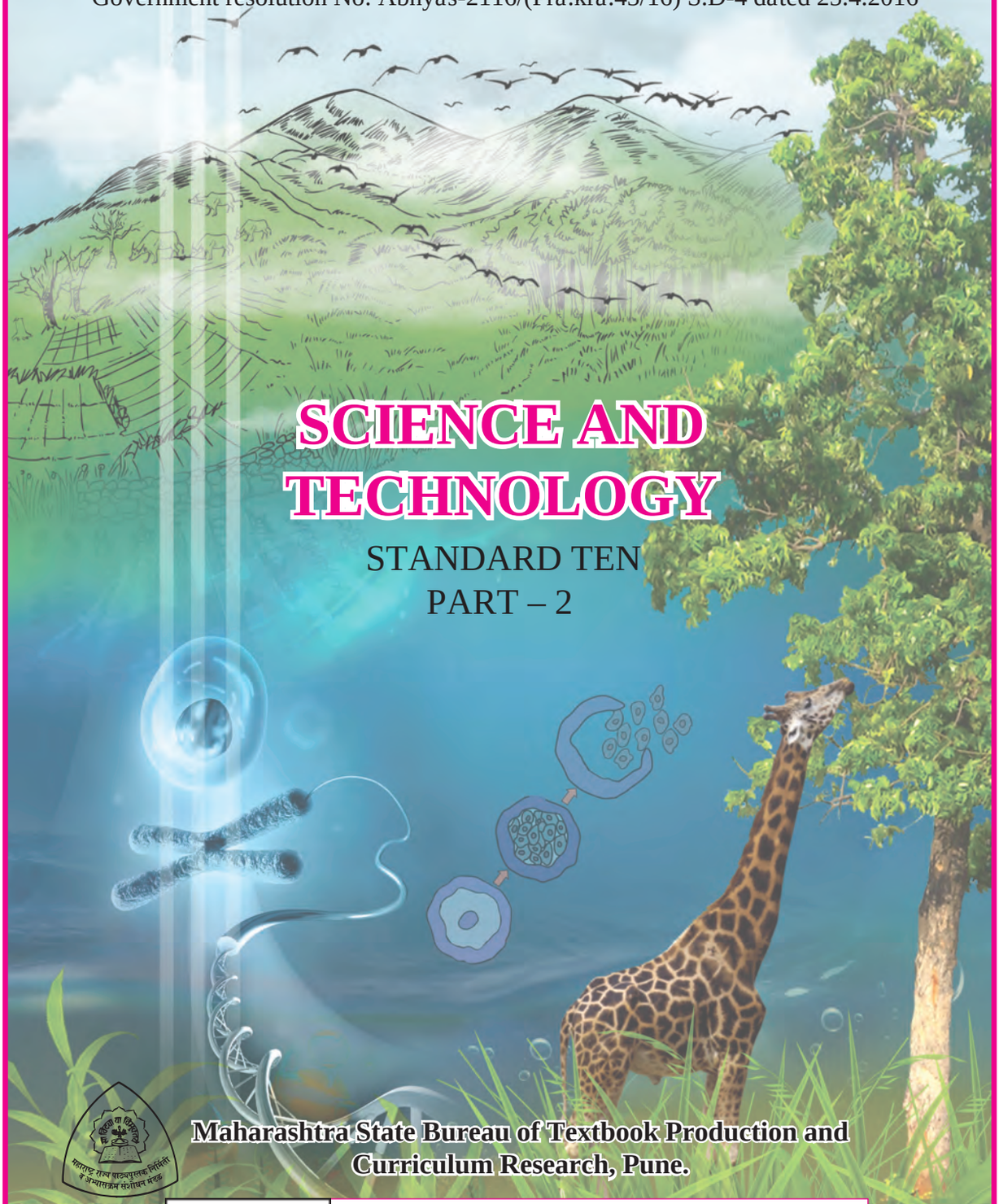

SCIENCE AND TECHNOLOGY

STANDARD TEN

PART – 2

Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune.

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The Constitution of India

Preamble

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens :

JUSTICE, social, economic and political ;

LIBERTY of thought, expression, belief, faith and worship ;

EQUALITY of status and of opportunity ; and to promote among them all

FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation ;

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

NATIONAL ANTHEM

Jana-gana-mana-adhināyaka jaya hē
Bhārata-bhāgya-vidhātā,

Panjāba-Sindhu-Gujarāta-Marāthā
Drāvida-Utkala-Banga

Vindhya-Himāchala-Yamunā-Gangā
uchchala-jaladhi-taranga

Tava subha nāmē jāgē, tava subha āsisa māgē,
gāhē tava jaya-gāthā,

Jana-gana-mangala-dāyaka jaya hē
Bhārata-bhāgya-vidhātā,

Jaya hē, Jaya hē, Jaya hē,
Jaya jaya jaya, jaya hē.

PLEDGE

India is my country. All Indians are my brothers and sisters.

I love my country, and I am proud of its rich and varied heritage. I shall always strive to be worthy of it.

I shall give my parents, teachers and all elders respect, and treat everyone with courtesy.

To my country and my people, I pledge my devotion. In their well-being and prosperity alone lies my happiness.

Preface

Dear students

Welcome to Std X. We have great pleasure in offering you this Science and Technology textbook based on the new syllabus. From the primary level till today, you have studied science from various textbooks. In this textbook, you will be able to study the fundamental concepts of science and technology from a different point of view through the medium of the different branches of Science.

The basic purpose of this textbook Science and Technology Part-2 can be said to be 'Understand and explain to others' the Science and Technology that relates to our everyday life. While studying the concepts, principles and theories in science, do make the effort to understand their connection with day to day affairs. While studying from this textbook, use the sections 'Can you recall?' and 'Can you tell?' for revision. You will learn science through the many activities given under the titles such as 'Observe and discuss.' and 'Try this' or 'Let's try this. Make sure that you perform all these activities. Activities like 'Use your brain power!', 'Research', 'Think about it' will stimulate your power of thinking.

Many experiments have been included in the textbook. Carry out these experiments yourself, following the given procedure and making your own observations. Ask your teachers, parents or classmates for help whenever you need it, interesting information, which reveals the science underlying the events we commonly observe and the technology developed on its basis, has been given in details in this textbook through several activities. In this world of rapidly developing technology, you have already become familiar with computers and smartphones. While studying the textbook, make full and proper use of the devices of information communication technology, which will make your studies easier. For more effective studies, you can avail additional audio-visual material for each chapter using the Q.R code through an App. This will definitely help you in your studies.

While carrying out the given activities and experiments, take all precautions with regard to handling apparatus, chemicals, etc. and encourage others to take the same precautions.

It is expected that while carrying out activities or observation involving plants and animals, you will also make efforts towards conservation of the environment. You must of course take all the care to avoid causing any harm or injury to them.

Do tell us about the parts that you like, as well as about the difficulties that you face as you read and study and understand this textbook.

Our west wishes for your academic progress.

(Dr. Sunil Magar)
Director
Maharashtra State Bureau of Textbook and Curriculum Research, Pune

Pune
Date: 18 March 2018, Gudhipadva
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For Teachers

- The real objective of science education is to learn to be able to think about events that are happening around us, logically and with discretion.
- In view of the age group of Std X students, it would be appropriate now, in the process of science education, to give freedom and scope to students' own curiosity about the events of the world, their propensity to go looking for the causes behind them and to their own initiative and capacity to take the lead.
- As experimentation is necessary to learn the skills of observation, logic, estimation, comparison and application of available data, which form a part of science education, deliberate efforts must be made to develop these skills while dealing with laboratory experiments give in the textbook. All observations that the students have noted should be accepted and then they should be helped to achieve that the expected results.
- These two years in middle school lay the foundation of higher education in Science. Hence, it is our duty and responsibility to enrich and enhance the student's interest in science. You all will of course always actively pursue the objective of developing their creativity and imbuing them with a scientific temper.
- You can use 'Let's recall' to review the previous knowledge for a lesson and 'Can you tell?' to introduce a topic by eliciting all the knowledge that the students already have about it from their own reading or experience. You may of course use any of your own activities or questions for this purpose. Activities given under 'Try this' and 'Let's try this' help to explain the content of the lesson. The former are for students to do themselves and the latter are those that you are expected to demonstrate. 'Use your brain power!' is meant for application of previous knowledge as well as the new lesson, and 'Always remember' gives important suggestions/information or values. 'Research', 'Find out', 'Do you know?' ' Introduction to scientists' and 'Institutes at work' are meant to give some information about the world outside the textbook and to develop the habit of doing independent reference work to obtain additional information.
- This textbook is not meant for reading and explaining in the classroom but guiding students to learn the methods of gaining knowledge by carrying out the given activities. An informal atmosphere in the classroom is required to achieve the aims of this textbook. All students should be encouraged to participate in discussions, experiments and activities. Special efforts should be made to organize presentations or report-reading in the class based on students activities and projects, besides observing of Science Day and other relevant occasions/days.
- The science and technology content of the textbook has been complemented with Information Communication Technology. These activities are to be conducted under your guidance along with the learning of various new scientific concepts.

Front and back covers : Pictures of various activities, experiments and concepts in the book.

Competency Statements Std X

The students are expected to achieve the following competency level after studying the text book Science and Technology II

The Living World.

* To analyze the scientific information about heredity and state opinions about new hybrid species.
* To understand evolution theories or living and state there characteristics.
* To explain reproductive systems of plants and animals.
* To state importance of cell science by collection of information of cell on utility and various medical facilities.
* To understand production processes of various biotic factors by experiments and prove them scientifically.
* To collect and analyze useful data by observing diversity of animals through different tools.
* To describe animals in the surroundings on scientific basis and classify them.
* To develop awareness of hobbies like watching the things and their conservation.
* To present documentary on animals.
* To collect useful and scientific information on human reproductive system and explain effects on society.
* To eradicate superstitions and rigid customs prevailing in society.

Natural resources and disaster management

* To explain role of environmental guard by conservation of environment, various laws and rules.
* To adapt scientific life style in the role of environmental guard.
* Get attention of society towards negligence towards conservation of environment.
* To plan and implement programs about conservation of environment.
* To play self-role in disaster management considering international understanding, help and togetherness.

Diet and Nutrition

* To set up the experiments, projects in our environment in small scale considering advantages and disadvantages of Biotechnology.
* To aware farmers and components of society by various graphs of Biotechnology.
* To take feedback of comparative study of progress of Biotechnology in India and the other countries.
* To find out various problems regarding conservation of ecosystems.
* To collect data on conservation of ecosystem and to take a distinct role to awake the society.
* To change one's lifestyle by taking into account the various aspects and effects which endanger social health.
* To spread the roles of government and non-government organizations to nurture social health.

Energy

* By considering the serious consequences of the energy crisis, adopt proper lifestyle and motivating others to decide their lifestyle accordingly.
* Explain the steps involved in the process of generation of electrical energy.
* To analyze the correlation of electricity generation processes and environment.
* Knows the importance of green energy and saves energy in daily life.

Information Communication Technology.

* Use of Information Communication Technology in daily life.
* Exchange of knowledge about science and Technology with the help of internet.
* Awareness about the proper use of information communication technology.
* Based on the information gathering, with various types of information related to Science and Technology. To predict it. Ability of prediction on the basis of science and technology data collected from internet.
* To understand dangers (cybercrimes) while using information communication technology and take precautions against them.
* Effective use of various systems developed through information communication technology in daily life.

CONTENT

Academic Planning

Two separate books have been prepared for science and technology. Science and technology part 2 contains ten chapters mainly related to Biology, Environment, Microbiology, Biotechnology. While thinking about science and technology, it is expected that an integrated approach will be taken while teaching and a connection will be made between different components of science and technology. In previous standards, we have studied various topics in science and technology together. For technical ease two separate books of science and technology part 1 and part 2 have been prepared, but it is necessary that an integrated perspective be taken while teaching.

Out of the ten chapters included in textbook science and technology part 2, the first five chapters are expected to be taught in the first session while the next five chapters in the second session. At the end of a session, a written examination for 40 marks and a practical examination for ten marks should be conducted. Exercises and projects have been given at the end of every chapter in the text book.

In view of evaluation, representative questions similar to those in the activity sheets of language books are given in exercises. You may make similar other questions for your use. The students should be evaluated based on these questions. Detailed information about this will be given in separate evaluation scheme.