

PHYSICAL SCIENCE

CLASS VIII

Editors

Prof. Kamal Mahendroo,
Vidya Bhavan Educational Resource Centre,
Udaipur, Rajasthan.

Dr.B. Krishna rajulu Naidu,
Retd., Professor of Physics
Osmania University, Hyderabad.

Dr.M. Adinarayana,
Retd., Professor of Chemistry
Osmania University, Hyderabad.

Dr. N. Upendar Reddy,
Professor & Head C&T Dept.,
SCERT., A.P., Hyderabad.

Academic Support

Prof. V. Sudhakar
Dept of Education, EFLU, Hyderabad.

Miss. Preeti Misra,
Vidya Bhavan Educational Resource Centre,
Udaipur, Rajasthan.

Mr Kishore Darak,
Vidya Bhavan Educational Resource Centre,
Udaipur, Rajasthan.

Co-ordinators

Sri M. Ramabrahmam, Lecturer,
Govt. IASE, Masabtank, Hyderabad.

Dr. P. Shankar, Lecturer,
DIET Hanamakonda, Warangal.

Dr. TVS Ramesh,
Co-ordinator, C&T Dept.,
SCERT, AP, Hyderabad.



Published by Government of Andhra Pradesh, Hyderabad.

Respect the Law
Get the Rights

Grow by Education
Behave Humbly



© Government of Andhra Pradesh, Hyderabad.

New Edition

First Published 2013

All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means without the prior permission in writing of the publisher, nor be otherwise circulated in any form of binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

The copy right holder of this book is the Director of School Education, Hyderabad, Andhra Pradesh. We have used some photographs which are under creative common licence. They are acknowledge at the end of the book.

This Book has been printed on 70 G.S.M. S.S. Map litho,
Title Page 200 G.S.M. White Art Card

Free Distribution by Government of Andhra Pradesh

Printed in India
at the Andhra Pradesh Govt. Text Book Press,
Mint Compound, Hyderabad,
Andhra Pradesh.

Text Book Development Committee

Sri A. Satyanarayana Reddy, Director,
S.C.E.R.T., A.P., Hyderabad

Sri B. Sudhakar, Director,
Govt. Textbook printing press,
A.P., Hyderabad.

Dr.N. Upendar Reddy,
Professor & Head C&T Dept.,
S.C.E.R.T., A.P., Hyderabad.

Writers

Sri M. Ramabrahmam, Lecturer,
Govt. IASE, Masabtank, Hyderabad.

Dr. P. Shankar, Lecturer,
DIET Hanamakonda, Warangal.

Sri R. Ananda Kumar, SA,
ZPHS Laxmipuram, Visakhapatnam.

Dr. K. Suresh, SA,
ZPHS Pasaragonda, Warangal.

Sri K.V.K. Srikanth, SA,
GTWAHS S.L.Puram, Srikakulam.

Sri Y. Venkat Reddy, SA,
ZPHS Kudakuda, Nalgonda.

Sri M. Eswara Rao, SA,
GHS Sompeta, Srikakulam.

Sri Dr. S. Anjaneyulu, SA,
ZPHS Veeraballi, YSR Kadapa.

Sri Y. Guru Prasad, SA,
ZPHS Chinnacherukuru, Nellore.

Sri D. Madhusudhana Reddy, SA,
ZPHS Munagala, Nalgonda.

Sri K.L. Ganesh, SA,
ZPHS M.D.Mangalam, Chittoor.

Graphics & Designing

Sri K. Sudhakara Chary, SGT,
UPS Neelukurthy, Warangal.

Sri Kishan Thatoju, Computer Operator,
C&T Dept., SCERT, AP, Hyderabad.

Sri Kurra Suresh Babu, B.Tech., MA., MPhil
Mana Media Graphics, Hyderabad.

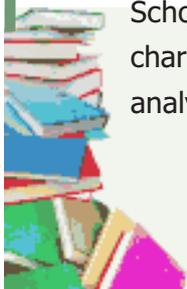
Intro ...

The nature is life source for all living organisms. Rocks, water, hills and valleys, trees, animals etc. embedded in it... each of them are unique by themselves. Everything has its own prominence. Human being is only a part of the nature. The aspect which distinguishes the humans from all other organisms and exclusive for them is their extraordinary thinking power. Thinking transforms a person as a unique entity from rest of the nature. Though it usually appears simple and normal, the intricacies of the very nature often challenges us to untie the tough knots of its hidden secrets, day in and day out.

The human being intuitionally contemplates and searches solutions for all the critical challenges, all around, relentlessly. Curiously, the questions and answers are concealed in the nature itself. The role of science, in fact, is to find them out. For this sake, some questions, some more thoughts, and some other investigations are quite necessary. Scientific study is to move on systematically in different ways, until discovering concrete solutions. Essence of the investigations lies in inquiring i.e. identifying questions, asking them and deriving adequate and apt answers. That is why, Galileo Galilei, the Italian astronomer, emphasized that scientific learning is nothing but improving the ability of questioning.

The teaching of science has to encourage children to think and work scientifically. Also, it must enhance their love towards the nature. Even it should enable them to comprehend and appreciate the laws governing the nature in designing tremendous diversity found around here and everywhere. Scientific learning is not just disclosing new things. It is also essential to go ahead with deep understanding of the nature's intrinsic principles; without interrupting the harmony of interrelation and interdependence in the nature.

It is also necessary to step forward without interrupting the interrelationship and interdependency along with understanding of the nature's intrinsic principles. High School children possess cognitive capacity of comprehending the nature and characteristics of the transforming world surrounding them. And they are able to analyze abstract concepts.



At this level, we cannot quench their sharp thinking capability with the dry teaching of mere equations and theoretic principles. For that, we should create a learning environment in the classroom which provides an opportunity for them to apply the scientific knowledge, explore multiple alternatives in solving problems and establish new relations.

Scientific learning is not just confined to the four walls of classroom. It has a definite connection to lab and field as well. Therefore, there is a lot of importance to field experience/ experiments in science teaching.

There is a great need for compulsory implementation of instructions of the National Curriculum Framework- 2005 which emphasizes linking of the science teaching with local environment. The Right to Education Act- 2009 also suggested that priority should be given to the achievement of learning competencies among children. Likewise, science teaching should be in such a way that it would help cultivate a new generation with scientific thinking. The key aspect of science teaching is to make the children understand the thinking process of scientists and their efforts behind each and every discovery. The State Curriculum Framework- 2011 stated that children should be able to express their own ideas and opinions on various aspects. All the genuine concepts should culminate into efficacious science teaching, make the teaching-learning interactions in the classroom, laboratory and field very effective and really become useful for the children to face the life challenges efficiently.

We thank the VidyaBhavan Society, Rajasthan, Dr. Desh Panday Rtd Prof. College of Engineering Osmania University and Sri D.R. Varaprasad former Lecturer ELTC Hyderabad for their cooperation in developing these new text books, the writers for preparing the lessons, the editors for checking the textual matters and the DTP group for cutely composing the text book.

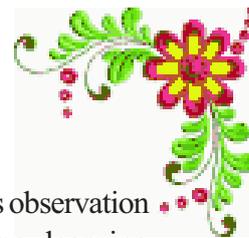
Teachers play a pivotal role in children's comprehensive use of the text book. We hope, teachers will exert their consistent efforts in proper utilization of the text book so as to inculcate scientific thinking process and inspire scientific approach in the children.

**Director,
SCERT, AP, Hyderabad**



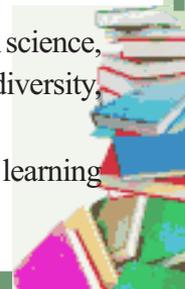
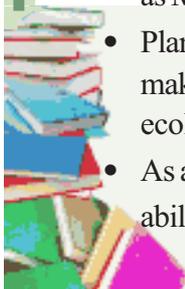


Dear teachers...



New Science Text Books are prepared in such a way that they develop children's observation power and research enthusiasm. It is a primary duty of teachers to devise teaching- learning processes which arouse children's natural interest of learning things. The official documents of National & State Curriculum Frameworks and Right to Education Act are aspiring to bring grass root changes in science teaching. These textbooks are adopted in accordance with such an aspiration. Hence, science teachers need to adapt to the new approach in their teaching. In view of this, let us observe certain **Dos** and **Don'ts**:

- Read the whole text book and analyze each and every concept in it in depth.
- In the text book, at the beginning and ending of an activity, a few questions are given. Teacher need to initiate discussion while dealing with them in the classroom, attempt to derive answers; irrespective of right or wrong responses, and so try to explain concept.
- Develop/Plan activities for children which help them to understand concepts presented in text.
- Textual concepts are presented in two ways: one as the classroom teaching and the other as the laboratory performance.
- Lab activities are part and parcel of a lesson. So, teachers must make the children conduct all such activities during the lesson itself, but not separately.
- Children have to be instructed to follow scientific steps while performing lab activities and relevant reports can be prepared and displayed.
- In the text some special activities as boxed items- 'think and discuss, let us do, conduct interview, prepare report, display in wall magazine, participate in Theatre Day, do field observation, organize special days' are presented. To perform all of them is compulsory.
- 'Ask your teacher, collect information from library or internet' - such items must also be considered as compulsory.
- If any concept from any other subject got into this text, the concerned subject teacher has to be invited into the classroom to elucidate it.
- Collect info of relevant website addresses and pass on to students so that they can utilize internet services for learning science.
- Let there be science magazines and science books in the school library.
- Motivate every student to go through each lesson before it is being actually taught and encourage everyone to understand and learn independently, with the help of activities such as Mind Mapping and exciting discussions.
- Plan and execute activities like science club, elocution, drawing, writing poetry on science, making models *etc.* to develop positive attitude among children environment, biodiversity, ecological balance *etc.*
- As a part of continuous comprehensive evaluation, observe and record children's learning abilities during various activities conducted in classroom, laboratory and field.





We believe, you must have realized that the learning of science and scientific thinking are not mere drilling of the lessons but, in fact, a valuable exercise in motivating the children to explore solutions to problems all around by themselves systematically and preparing them to meet life challenges properly.

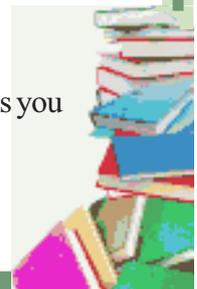
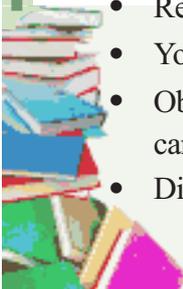


Dear Students...

Learning science does not mean scoring good marks in the subject. Competencies like thinking logically and working systematically, learned through it, have to be practiced in daily life. To achieve this, instead of memorizing the scientific theories by rote, one must be able to study them analytically. That means, in order to understand the concepts of science, you need to proceed by discussing, describing, conducting experiments to verify, making observations, confirming with your own ideas and drawing conclusions. This text helps you to learn in that way.

What you need to do to achieve such things:

- Thoroughly go through each lesson before the teacher actually deals with it.
- Note down the points you came across so that you can grasp the lesson better.
- Think of the principles in the lesson. Identify the concepts you need to know further, to understand the lesson in depth.
- Do not hesitate to discuss analytically about the questions given under the sub-heading 'Think and Discuss' with your friends or teachers.
- You may get some doubts while conducting an experiment or discussing about a lesson. Express them freely and clearly.
- Plan to implement experiment/lab periods together with teachers, to understand the concepts clearly. While learning through the experiments you may come to know many more things.
- Find out alternatives based on your own thoughts.
- Relate each lesson to daily life situations.
- Observe how each lesson is helpful to conserve nature. Try to do so.
- Work as a group during interviews and field trips. Preparing reports and displaying them is a must.
- List out the observations regarding each lesson to be carried through internet, school library and laboratory.
- Whether in note book or exams, write analytically, expressing your own opinions.
- Read books related to your text book, as many as you can.
- You organize yourself the Science Club programs in your school.
- Observe problems faced by the people in your locality and find out what solutions you can suggest through your science classroom.
- Discuss the things you learned in your science class with farmers, artisans *etc.*



ACADEMIC STANDARDS

S.No.	Academic Standard	Explanation
1.	Conceptual understanding	Children are able to explain, cite examples, give reasons, and give comparison and differences, explain the process of given concepts in the textbook. Children are able to develop their own brain mappings.
2.	Asking questions and making hypothesis	Children are able to ask questions to understand, to clarify the concepts and to participate in discussions. They are able to make hypothesis on given issues.
3.	Experimentation and field investigation.	To understand given concepts in the textbook children are able to do experiments on their own. They are able to participate in field investigation and making reports on them.
4.	Information skills and Projects	Children are able to collect information (by using interviews, internet etc.) and analyses systematically. They are able to conduct their own project works.
5.	Communication through drawing, model making	Children are able to explain their conceptual understanding by drawing figures and making models. Able to plotting graphs by using given information or collected data.
6.	Appreciation and aesthetic sense, values	Children are able to appreciate man power and nature, and have aesthetic sense towards nature. They are also able to follow constitutional values.
7.	Application to daily life, concern to bio diversity.	Children are able to utilize scientific concept to face their daily life situations. They are able to show concern towards bio diversity.

INDEX

	<i>Periods</i>	<i>Month</i>	<i>Page No.</i>
1 <i>Force</i>	12	June	1
2 <i>Friction</i>	12	July	19
3 <i>Synthetic fibres and plastics</i>	11	August	31
4 <i>Metals and non-metals</i>	12	September	50
5 <i>Sound</i>	12	October	63
6 <i>Coal and Petroleum</i>	12	November	81
7 <i>Combustion, fuels and Flame</i>	11	December	96
8 <i>Electric conductivity of liquids</i>	12	January	108
9 <i>Some natural phenomena</i>	12	February	120
10 <i>Stars and solar system</i>	14	March	136

OUR NATIONAL ANTHEM

- Rabindranath Tagore

*Jana gana mana adhinayaka Jaya he
Bharatha bhagya-vidhata
Punjab Sindhu Gujaratha Maratha
Dravida Utkala Banga.*

*Vindhya Himachala Jamuna Ganga
Uchchala Jaladhi taranga,
Tava shubha name jage
Tava shubha asisha mage
Gahe tava jaya gatha*

*Jana gana mangala-dayaka jaya he,
Bharatha bhagya –vidhatha,
Jaya he, jaha he, jaya he,
Jaya jaya jaya jaya he*

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. I shall be kind to animals.

To my country and my people, I pledge my devotion.

In their well-being and prosperity alone lies my happiness.”