

EXEMPLAR PROBLEMS

SCIENCE

CLASS VII



विद्यया ऽ मृतमश्नुते



एन सी ई आर टी
NCERT

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

ISBN 978-93-5007-200-4

First Edition

July 2012 Ashadha 1934

Reprinted

October 2012 Kartika 1934

November 2012 Kartika 1934

March 2014 Phalguna 1935

PD 5T RPS

© **National Council of Educational
Research and Training, 2012**

₹ 50.00

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, electronic, mechanical, photocopying, recording or otherwise without the prior permission of the publisher.
- This book is sold subject to the condition that it shall not, by way of trade, be lent, re-sold, hired out or otherwise disposed of without the publisher's consent, in any form of binding or cover other than that in which it is published.
- The correct price of this publication is the price printed on this page. Any revised price indicated by a rubber stamp or by a sticker or by any other means is incorrect and should be unacceptable.

OFFICES OF THE PUBLICATION DIVISION, NCERT

NCERT Campus
Sri Aurobindo Marg
New Delhi 110 016 Phone : 011-26562708

108, 100 Feet Road
Hosdakere Halli Extension
Banashankari III Stage
Bangaluru 560 085 Phone : 080-26725740

Navjivan Trust Building
P.O.Navjivan
Ahmedabad 380 014 Phone : 079-27541446

CWC Campus
Opp. Dhankal Bus Stop
Panihati
Kolkata 700 114 Phone : 033-25530454

CWC Complex
Maligaon
Guwahati 781 021 Phone : 0361-2674869

Publication Team

Head, Publication Division : *Ashok Srivastava*

Chief Production Officer : *Kalyan Banerjee*

Chief Editor : *Shweta Uppal*

Chief Business Manager : *Gautam Ganguly*

Editorial Assistant : *Mathew John*

Production Assistant : *Mukesh Gaur*

Cover

Shweta Rao

Printed on 80 GSM paper with NCERT watermark

Published at the Publication Division by the Secretary, National Council of Educational Research and Training, Sri Aurobindo Marg, New Delhi 110 016 and printed at Vijayalakshmi Printing Works Pvt. Ltd., B-117, Sector-5, Noida 201 301 (UP)

FOREWORD

The National Curriculum Framework (NCF) – 2005 initiated a new phase of development of syllabi and textbooks for all stages of school education. Conscious effort has been made to discourage rote learning and to diffuse sharp boundaries between different subject areas. This is well in tune with NPE – 1986 and Learning without Burden 1993 that recommend child-centred system of education. The textbooks for Classes VI, VII and VIII were released respectively in 2006, 2007 and 2008. Overall the books have been well-received by students and teachers.

The NCF – 2005 notes that treating the prescribed textbooks as the sole basis of examination is one of the key reasons why other resources and sites of learning are ignored. It further reiterates that the methods used for teaching and evaluation will also determine how effective these textbooks prove in making children's life at school a happy experience, rather than a source of stress or boredom.

The NCF further recommends that evaluation has to be integrated with the learning process and the routine activities and exercises going on in the classroom can be employed effectively to assess learning. This is so as the purpose of assessment is necessarily to improve the teaching-learning process and be able to gauge the extent to which capacity of learners have been developed.

With regard to development of questions for evaluation of students, NCF – 2005 has made specific recommendations. It emphasises that the types of questions which are set for evaluation, need to be beyond the textbook questions. Questions that are open ended and challenging should be used and they should test reasoning and creative abilities rather than memorisation of facts and figures. The question in constructivist evaluation should be framed in such a way that they do not seem to be an exercise that the teacher wants children to do.

In order to address such issues, the Department of Education in Science and Mathematics (DESM) has made an attempt to provide this additional learning material at the upper primary stage. This resource book contains different types of questions of varying difficulty level. These

problems are not meant to serve merely as question bank for examinations but are primarily meant to improve the quality of teaching-learning process in schools. It is expected that these problems would encourage teachers to design quality questions on their own. Students and teachers should always keep in mind that examination and assessment are meant to test comprehension, information recall, analytical thinking and problem-solving ability, creativity and speculative ability.

A team of experts and practising teachers with an understanding of the subject worked hard to accomplish this task. The material was thoroughly discussed and edited.

NCERT welcomes suggestions from students, teachers and parents which would help us to further improve the quality of the material in subsequent editions.

New Delhi
21 May 2008

YASH PAL
Chairperson
National Steering Committee
National Council of Educational
Research and Training

PREFACE

In view of the changes recommended in the National Curriculum Framework (NCF) – 2005 with regard to evaluation approaches, the Department of Education in Science and Mathematics (DESM), National Council of Educational Research and Training (NCERT) initiated the development of Exemplar Problems in Science and Mathematics for upper primary, secondary and higher secondary stages after completing the development of textbooks based on NCF-2005. The present book is a part of this series and is based on the contents of Science Textbook for Class VII published by the Council.

The main objective of the book on 'Exemplar Problems in Science' is to provide the teachers and students a large number of quality problems in various forms and format with varying levels of difficulty to facilitate teaching-learning of concepts in Science that are presented through the textbook for Class VII. It is envisaged that the problems included in this book would help the teachers to design tasks to assess effectiveness of their teaching and to know about the achievement of their students besides facilitating preparation of balanced question paper for testing their students. In addition, the problems given in this book are also expected to help the teachers to perceive the basic characteristics of good quality questions and motivate them to frame similar questions on their own. Students too can benefit themselves by attempting the exercises given in the book for self assessment and also in mastering the basic techniques of problem solving. Some of the problems given in the book are expected to challenge the students' understanding of Science concepts and to apply them in new situations.

The problems in this book were developed in workshop mode organised by the DESM involving practising teachers, subject experts from universities and institutes of higher learning and the members of the Science group of the DESM whose name appear separately. I gratefully acknowledge their efforts and thank them for their valuable contribution in our endeavour to provide good quality instructional material for the school system.

I express my gratitude to Professor G. Ravindra, former Joint Director and Acting Director, NCERT for his valuable motivation and guidance from time to time. Special thanks are due to Ms. Sunita L. Varte, *Coordinator* of this programme for her dedicated efforts and valuable contribution in making the manuscript pressworthy.

We look forward to feedback from students, teachers and parents for further improvement of the contents of the book.

HUKUM SINGH
Professor and Head
DESM, NCERT
New Delhi

© NCERT
not to be republished

DEVELOPMENT TEAM

MEMBERS

Anand V. Venkatesh, *Associate Professor*, RIE, Mysore

Anjni Koul, *Assistant Professor*, DESM, NCERT, New Delhi

Bharati Sarkar, *Associate Professor (Zoology)*, Retd., Maitreyi College
University of Delhi, New Delhi

Charu Maini, *PGT(Chemistry)*, Amity International School, Noida

C. V. Shimray, *Assistant Professor*, DESM, NCERT, New Delhi

K. K. Sharma, *Principal*, Retd., College of Education, Ajmer

Meenambika Menon, *TGT(Science)*, Cambridge School, Sector-27, Noida

Monika Chopra, *PGT(Chemistry)*, NC Jindal Public School, New Delhi

Rachna Garg, *Assistant Professor*, DESM, NCERT, New Delhi

R. Joshi, *Associate Professor*, Retd., DESM, NCERT, New Delhi

R.R. Koireng, *Assistant Professor*, DESM, NCERT, New Delhi

R.S. Sindhu, *Professor*, DESM, NCERT, New Delhi

Sarita Kumar, *Associate Professor (Zoology)*, Acharya Narendra Dev
College, University of Delhi, New Delhi

Shashi Prabha, *Assistant Professor*, DESM, NCERT, New Delhi

Sher Singh, *PGT(Physics)*, Navyug School, Laxmibai Nagar, New Delhi

Shyam Kumar Singh, *TGT(Science)*, DMS, RIE, Bhopal

Vandana Saxena, *TGT(Science)*, Retd., Kendriya Vidyalaya Sangathan

V. B. Bhatia, *Professor(Physics)*, Retd., University of Delhi, Delhi

MEMBER COORDINATOR

Sunita L. Varte, *Assistant Professor*, DESM, NCERT, New Delhi

ACKNOWLEDGEMENT

The National Council of Educational Research and Training is grateful to the members of Development Committee, whose names appear separately, for their contribution in the development of this book. The Council also gratefully acknowledges the contribution of the following members who participated in the review of the manuscript– Kanhiya Lal, *Principal*, Retd., Directorate of Education, Delhi; K.K. Arora, *Associate Professor*, Department of Chemistry, Zakir Hussain College, University of Delhi, Delhi; Meena Kumari, *Joint Director*, SCERT, Manipur; Puneeta Sharma, *TGT (Science) LD Jain Senior Secondary School*, Sadar Bazar, New Delhi; Shibani Goswami, *PGT (Biology)*, Retd., BIK-I, 1756, CR Park, New Delhi; Vijay Kumar Sanodia, *TGT (Science)*, Maharishi Vidya Mandir, Hoshangabad Road, Bhopal.

Special thanks are due to Hukum Singh, *Professor and Head*, Department of Education in Science and Mathematics, NCERT, New Delhi for providing all academic and administrative support.

The Council also gratefully acknowledges the support provided by the staff of DESM: Deepak Kapoor, *Incharge*, Computer Station; Narender Kr. Verma, Kamal Kumar, Girish Goyal, Shehzadi Begum and Kanwaljeet Kaur, *DTP Operators*; K.T. Chitralkha, *Copy Editor*.

The efforts of the Publication Department, NCERT in bringing out this publication are also appreciated.

CONTENTS

<i>Foreword</i>		iii
<i>Preface</i>		v
Chapter 1	NUTRITION IN PLANTS	1
Chapter 2	NUTRITION IN ANIMALS	6
Chapter 3	FIBRE TO FABRIC	15
Chapter 4	HEAT	21
Chapter 5	ACIDS, BASES AND SALTS	27
Chapter 6	PHYSICAL AND CHEMICAL CHANGES	33
Chapter 7	WEATHER, CLIMATE AND ADAPTATION OF ANIMALS TO CLIMATE	38
Chapter 8	WIND, STORM AND CYCLONE	42
Chapter 9	SOIL	47
Chapter 10	RESPIRATION IN ORGANISMS	52
Chapter 11	TRANSPORTATION IN ANIMALS AND PLANTS	57
Chapter 12	REPRODUCTION IN PLANTS	62
Chapter 13	MOTION AND TIME	67
Chapter 14	ELECTRIC CURRENT AND ITS EFFECTS	75
Chapter 15	LIGHT	80
Chapter 16	WATER : A PRECIOUS RESOURCE	84
Chapter 17	FORESTS : OUR LIFELINE	89
Chapter 18	WASTEWATER STORY	93
	ANSWERS	98
	APPENDIX	138
	SAMPLE QUESTION PAPER	139

Do You Know

According to the 86th Constitutional Amendment Act, 2002, free and compulsory education for all children in the 6–14-year age group is now a Fundamental Right under Article 21-A of the Constitution.

EDUCATION IS NEITHER A PRIVILEGE NOR FAVOUR BUT A BASIC HUMAN RIGHT TO WHICH ALL GIRLS AND WOMEN ARE ENTITLED

*Give Girls
Their Chance !*

