

ગુજરાત રાજ્યના શિક્ષણવિભાગના પત્ર-ક્રમાંક
મશબ / 1211 / 414 / છ, તા. 1-2-2012- થી મંજૂર

BIOLOGY

Standard 12

(Semester III)



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 respect my parents, teachers and all my elders and treat everyone with courtesy.
I pledge my devotion to my country and its people.
My happiness lies in their well-being and prosperity.

રાજ્ય સરકારની વિનામૂલ્યે યોજના હેઠળનું પુસ્તક



Gujarat State Board of School Textbooks
'Vidyayan', Sector 10-A, Gandhinagar-382010

© Gujarat State Board of School Textbooks, Gandhinagar
Copyright of this book is reserved by Gujarat State Board of School Textbooks.
No reproduction of this book in whole or in part, in any form is permitted without
written permission of the Director, Gujarat State Board of School Textbooks.

Authors

Dr. M. I. Patel (Conviner)
Dr. Y. M. Dalal
Dr. B. K. Jain
Dr. Yogesh B. Dabgar
Dr. Chirag Acharya
Dr. Narsinh B. Patel

Reviewers

Dr. Naresh K. Fitar	Dr. Sanjay Vedia
Dr. Alkesh I. Shah	Dr. Zankhnaben Rathod
Dr. Tarak Thakkar	Shri P. M. Parikh
Shri Nitin D. Dave	Shri Jaysukh B. Harmani
Shri Sunil Bhawe	Smt. Bhargavi Vankhede

Artist

Shilp Graphics

Co-ordination

Shri Chirag H. Patel
(Subject Co-ordinator : Physics)

Preparation and Planning

Shri C. D. Pandya
(Dy. Director : Academic)

Lay-out and Planning

Shri Haresh S. Limbachiya
(Dy. Director : Production)

PREFACE

The Gujarat State Secondary and Higher Secondary Education Board has prepared new syllabi in accordance with the new national syllabi prepared by the NCERT based on NCF-2005 and core-curriculum. These syllabi are sanctioned by the Government of Gujarat.

It is a pleasure for the Gujarat State Board of School Textbooks to place before the students this textbook of **Biology, Standard 12, (Semester III)** prepared according to the new syllabus.

Before publishing the textbook, its manuscript has been fully reviewed by experts and teachers teaching at this level. Following suggestions given by teachers and experts. We have made necessary changes in the manuscript before publishing the textbook.

The board has taken special care to ensure that this textbook is interesting, useful and free from errors. However, we welcome any suggestion, from people interested in education, to improve the quality of the textbook.

H. K. Patel GAS

Director

Date : 1-9-2013

Dr. Nitin Pethani

Executive President

Gandhinagar

First Edition : 2012, Reprint : 2013, 2013

Published by : H. K. Patel, Director, on behalf of Gujarat State Board of School Textbooks,
'Vidyayan', Sector 10-A, Gandhinagar

Printed by :

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 wildlife, 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.

Index

1.	Transport in Plants	1
2.	Mineral Nutrition	13
3.	Photosynthesis	28
4.	Respiration	41
5.	Digestion And Absorption	53
6.	Breathing and Exchange of Gases	67
7.	Body Fluids and Circulation	77
8.	Excretory Products And Their Elimination	90
9.	Locomotion and Movement	100
10.	Organisms and Population	111
11.	Ecosystem	129
12.	Biodiversity and Its Conservation	142
13.	Environmental Issues	159



ગુજરાત રાજ્યના શિક્ષણવિભાગના પત્ર-ક્રમાંક
મશબ / 1211 / 414 / છ, તા. 1-2-2012- થી મંજૂર

BIOLOGY

Standard 12

(Semester III)



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 respect my parents, teachers and all my elders and treat everyone with courtesy.
I pledge my devotion to my country and its people.
My happiness lies in their well-being and prosperity.

રાજ્ય સરકારની વિનામૂલ્યે યોજના હેઠળનું પુસ્તક



Gujarat State Board of School Textbooks
'Vidyayan', Sector 10-A, Gandhinagar-382010

© Gujarat State Board of School Textbooks, Gandhinagar
Copyright of this book is reserved by Gujarat State Board of School Textbooks.
No reproduction of this book in whole or in part, in any form is permitted without
written permission of the Director, Gujarat State Board of School Textbooks.

Authors

Dr. M. I. Patel (Convener)
Dr. Y. M. Dalal
Dr. B. K. Jain
Dr. Yogesh B. Dabgar
Dr. Chirag Acharya
Dr. Narsinh B. Patel

Reviewers

Dr. Naresh K. Fitar	Dr. Sanjay Vedia
Dr. Alkesh I. Shah	Dr. Zankhnaben Rathod
Dr. Tarak Thakkar	Shri P. M. Parikh
Shri Nitin D. Dave	Shri Jaysukh B. Harmani
Shri Sunil Bhawe	Smt. Bhargavi Vankhede

Artist

Shilp Graphics

Co-ordination

Shri Chirag H. Patel
(Subject Co-ordinator : Physics)

Preparation and Planning

Shri C. D. Pandya
(Dy. Director : Academic)

Lay-out and Planning

Shri Haresh S. Limbachiya
(Dy. Director : Production)

PREFACE

The Gujarat State Secondary and Higher Secondary Education Board has prepared new syllabi in accordance with the new national syllabi prepared by the NCERT based on NCF-2005 and core-curriculum. These syllabi are sanctioned by the Government of Gujarat.

It is a pleasure for the Gujarat State Board of School Textbooks to place before the students this textbook of **Biology, Standard 12, (Semester III)** prepared according to the new syllabus.

Before publishing the textbook, its manuscript has been fully reviewed by experts and teachers teaching at this level. Following suggestions given by teachers and experts. We have made necessary changes in the manuscript before publishing the textbook.

The board has taken special care to ensure that this textbook is interesting, useful and free from errors. However, we welcome any suggestion, from people interested in education, to improve the quality of the textbook.

H. K. Patel GAS

Director

Date : 1-9-2013

Dr. Nitin Pethani

Executive President

Gandhinagar

First Edition : 2012, Reprint : 2013, 2013

Published by : H. K. Patel, Director, on behalf of Gujarat State Board of School Textbooks,
'Vidyayan', Sector 10-A, Gandhinagar

Printed by :

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 wildlife, 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.

Index

1. Transport in Plants	1
2. Mineral Nutrition	13
3. Photosynthesis	28
4. Respiration	41
5. Digestion And Absorption	53
6. Breathing and Exchange of Gases	67
7. Body Fluids and Circulation	77
8. Excretory Products And Their Elimination	90
9. Locomotion and Movement	100
10. Organisms and Population	111
11. Ecosystem	129
12. Biodiversity and Its Conservation	142
13. Environmental Issues	159

