

नया आगाज़

आज समय की माँग पर
आगाज़ नया इक होगा
निरंतर योग्यता के निर्णय से
परिणाम आकलन होगा।

परिवर्तन नियम जीवन का
नियम अब नया बनेगा
अब परिणामों के भय से
नहीं बालक कोई डरेगा

निरंतर योग्यता के निर्णय से
परिणाम आकलन होगा।

बदले शिक्षा का स्वरूप
नई खिले आशा की धूप
अब किसी कोमल-से मन पर
कोई बोझ न होगा

निरंतर योग्यता के निर्णय से
परिणाम आकलन होगा।

नई राह पर चलकर मंज़िल को हमें पाना है
इस नए प्रयास को हमने सफल बनाना है
बेहतर शिक्षा से बदले देश, ऐसे इसे अपनाएं
शिक्षक, शिक्षा और शिक्षित
बस आगे बढ़ते जाएँ
बस आगे बढ़ते जाएँ
बस आगे बढ़ते जाएँ.....





PROJECT BASED LEARNING *in Schools* CLASSES: IX-X

www.FirstRanker.com



CENTRAL BOARD OF SECONDARY EDUCATION

Shiksha Kendra, 2, Community Centre, Preet Vihar, Delhi-110 092 India



Project-Based Learning in Schools for Classes IX to X

Price: ₹

First Edition 2015, CBSE, India

Copies:

**"This book or part thereof may not be reproduced by
any person or agency in any manner."**

www.FirstRanker.com

Published By : The Secretary, Central Board of Secondary Education,
Shiksha Kendra, 2, Community Centre, Preet Vihar,
Delhi-110092

Design, Layout : Multi Graphics, 8A/101, W.E.A. Karol Bagh, New Delhi-110005
Phone : 011-25783846, 47503846

Printed By :

भारत का संविधान

उद्देशिका

हम, भारत के लोग, भारत को एक सम्पूर्ण 'प्रभुत्व-संपन्न समाजवादी पंथनिरपेक्ष लोकतंत्रात्मक गणराज्य बनाने के लिए, तथा उसके समस्त नागरिकों को:

सामाजिक, आर्थिक और राजनैतिक न्याय,
विचार, अभिव्यक्ति, विश्वास, धर्म

और उपासना की स्वतंत्रता,
प्रतिष्ठा और अवसर की समता

प्राप्त कराने के लिए
तथा उन सब में व्यक्ति की गरिमा

'और राष्ट्र की एकता और अखंडता
सुनिश्चित करने वाली बंधुता बढ़ाने के लिए

वृद्धसंकल्प होकर अपनी इस संविधान सभा में आज तारीख 26 नवम्बर, 1949 ई० को एतद्वारा इस संविधान को अंगीकृत, अधिनियमित और आत्मार्पित करते हैं।

1. संविधान (बयालीसवां संशोधन) अधिनियम, 1976 की धारा 2 द्वारा (3.1.1977) से "प्रभुत्व-संपन्न लोकतंत्रात्मक गणराज्य" के स्थान पर प्रतिस्थापित।
2. संविधान (बयालीसवां संशोधन) अधिनियम, 1976 की धारा 2 द्वारा (3.1.1977) से "राष्ट्र की एकता" के स्थान पर प्रतिस्थापित।

भाग 4 क

मूल कर्तव्य

51 क. मूल कर्तव्य - भारत के प्रत्येक नागरिक का यह कर्तव्य होगा कि वह -

- (क) संविधान का पालन करे और उसके आदर्शों, संस्थाओं, राष्ट्रध्वज और राष्ट्रगान का आदर करे;
- (ख) स्वतंत्रता के लिए हमारे राष्ट्रीय आंदोलन को प्रेरित करने वाले उच्च आदर्शों को हृदय में संजोए रखे और उनका पालन करे;
- (ग) भारत की प्रभुता, एकता और अखंडता की रक्षा करे और उसे अक्षुण्ण रखे;
- (घ) देश की रक्षा करे और आह्वान किए जाने पर राष्ट्र की सेवा करे;
- (ङ) भारत के सभी लोगों में समरसता और समान भ्रातृत्व की भावना का निर्माण करे जो धर्म, भाषा और प्रदेश या वर्ग पर आधारित सभी भेदभाव से परे हों, ऐसी प्रथाओं का त्याग करे जो स्त्रियों के सम्मान के विरुद्ध हैं;
- (च) हमारी सामासिक संस्कृति की गौरवशाली परंपरा का महत्त्व समझे और उसका परिरक्षण करे;
- (छ) प्राकृतिक पर्यावरण की जिसके अंतर्गत वन, झील, नदी, और वन्य जीव हैं, रक्षा करे और उसका संवर्धन करे तथा प्राणी मात्र के प्रति दयाभाव रखे;
- (ज) वैज्ञानिक दृष्टिकोण, मानववाद और ज्ञानार्जन तथा सुधार की भावना का विकास करे;
- (झ) सार्वजनिक संपत्ति को सुरक्षित रखे और हिंसा से दूर रहे;
- (ञ) व्यक्तिगत और सामूहिक गतिविधियों के सभी क्षेत्रों में उत्कर्ष की ओर बढ़ने का सतत प्रयास करे जिससे राष्ट्र निरंतर बढ़ते हुए प्रयत्न और उपलब्धि की नई उंचाइयों को छू ले;
- ¹(ट) यदि माता-पिता या संरक्षक है, छह वर्ष से चौदह वर्ष तक की आयु वाले अपने, यथास्थिति, बालक या प्रतिपाल्य के लिये शिक्षा के अवसर प्रदान करे।

1. संविधान (छयासीवां संशोधन) अधिनियम, 2002 की धारा 4 द्वारा प्रतिस्थापित।

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 the² 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.**

-
1. Subs, by the Constitution (Forty-Second Amendment) Act. 1976, sec. 2, for "Sovereign Democratic Republic" (w.e.f. 3.1.1977)
 2. Subs, by the Constitution (Forty-Second Amendment) Act. 1976, sec. 2, for "unity of the Nation" (w.e.f. 3.1.1977)
-

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, 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;
- ¹(k) who is a parent or guardian to provide opportunities for education to his/her child or, as the case may be, ward between age of 6 and 14 years.

-
1. Subs. by the Constitution (Eighty - Sixth Amendment) Act, 2002
-



Preface

The CBSE's initiative to develop materials on Project Based Learning (PBL) in Schools at the secondary level is a progressive step towards empowering educators as well as learners to undertake mini research, innovate and understand interdisciplinary approach to education. This initiative is in accordance with the National Curriculum Framework (NCF) 2005, which has provided the guidelines that focus on the process of learning, and construction of knowledge, rather than memory based short-term accumulation of information by learners. *"Learning has become a source of burden and stress on children and their parents. There is evidence of a deep distortion in the quality and aims of education"*. To remove the burden and stress associated with learning, the NCF 2005 suggested (i) connecting knowledge to the environment outside the school (ii) ensuring learning shifts away from rote methods and (iii) enriching curriculum so that it goes beyond text books.

Education has to become a critical catalyst in the process of social transformation and it should not burden but empower children. Therefore, it becomes necessary to bring about changes in the current teaching learning methodology. PBL connects and links knowledge gained in the school to life outside the school and ensures that learning is a '*joyful experience*'. This collection of resource materials is an attempt to shift the teaching-learning process towards a more experiential, participatory and constructivist approach.

Project Based Learning, which goes back to over a hundred years, is a form of situated learning, based on the constructivist finding that, students gain a deeper understanding of materials when they actively construct their understanding by working with and using ideas. In PBL, students engage in real, meaningful problems that are important to them. Unlike traditional instruction that culminates in a problem after basic instruction on facts and skills, PBL begins with a problem, followed by the teaching facts and skills in a relevant context. It allows students to investigate questions, proposes hypotheses and explanations, discusses their ideas, challenges the ideas of others, and tries out new ideas. This learning technique is student - centered with the teacher on the periphery playing the role of a facilitator or manager. Project Based Learning builds on four major learning ideas: (1) Active construction, (2) Situated learning, (3) Social interactions, and (4) Cognitive tools. Through Project Based Learning, students get the opportunity to reflect on the core concepts and principles of a subject using hands-on learning methods.

CBSE called for a few sample projects from various schools, to obtain feedback about the quality and scope of the projects implemented in affiliated schools. It is disheartening to note that, most of the projects given in the schools are just a collection of information from web-based sources or of a very



elementary level, using 'cut and paste' technique. Some schools have effectively implemented PBL grounded on co-operative learning, although much needs to be done.

It has been concluded from the exercise that, the project work is not being implemented in its right spirit or approach, and inspite of the projects helping students in grasping the concepts better, they have proved to be a burden on parents. It is also felt that, the '*joy of learning*' is missing in the entire process.

Sensitised to the seriousness of the issue, CBSE has developed the Project Based Learning Manual with a hope that it can guide teachers and students in adopting the inter-disciplinary approach to understanding key concepts in various subjects.

Teachers are expected to guide the students throughout the process of project based learning. It should not be considered as an additional curricular burden, rather then should integrate the project based approach in their regular course of instruction so that students learn by doing and thereby attain deeper conceptual understanding.

I appreciate the efforts of Ms. Sugandh Sharma, Additional Director (I & R) and her team of officers and experts who have applied their research skills to examine the applicability of ideas and put in their sincere hard work to develop this manual.

All constructive suggestions to improve this would be greatly appreciated and will be considered for inclusion in the future editions.

Dr. Satbir Bedi, IAS
Chairperson, CBSE



Acknowledgements

Advisory

- * Dr. Satbir Bedi, IAS, Chairperson, CBSE

Over all Co-ordination

- * Ms. Sugandh Sharma, Additional Director & I/C Research & Innovation, CBSE

Co-ordination

1. Ms. Vijaya Lakshmi, Principal GD Salwan, Rajender Nagar, Delhi
2. Ms. Sharmila Raheja, Principal, Uttam School, Ghaziabad, Delhi
3. Ms. Rina Singh, Principal, GD Goenka Public School, Ghaziabad
4. Ms. S. Radha Mahalakshmi, Ex. Additional Director, CBSE
5. Mr. Sandeep Sethi, Education Officer, CBSE

Material Development

English Section

1. Ms. Arti Khanna, HM, Uttam School for Girls, Ghaziabad
2. Ms. Farha Khan, TGT (English), Uttam School for Girls, Ghaziabad
3. Ms. V. Rohini, TGT (English), Uttam School for Girls, Ghaziabad
4. Ms. Rashmi Mittal, TGT (English), KV Vignan Vihar, Delhi
5. Ms. Casilda Nimmi, TGT (English), KV-1 AFS Tambaran, Chennai
6. Mr. Saptrishi Majumdar, TGT (English), KV, Dimapur, Nagaland

Hindi Section

1. Ms. Mridula Joshi, Vice Principal, KV, Tagore Garden, Delhi
2. Ms. Nirmala Joshi, PGT (Hindi), KV, Tagore Garden, Delhi
3. Ms. Sudha Awasthi, TGT (Hindi), KV, Tagore Garden, Delhi

Mathematics Section

1. Ms. Rekha Goel, TGT (Mathematics), GD Salwan, Rajender Nagar, Delhi

2. Mr. Ganesh Chandra, PGT, GD Salwan, Rajender Nagar, Delhi
3. Ms. Deepika Khurana, TGT (Mathematics), GD Salwan, Rajender Nagar, Delhi
4. Ms. Aarti Sharma, PRT, GD Salwan, Rajender Nagar, Delhi

Science Section

1. Ms. Ameeta, PGT, KVS, ZIET, Chandigarh (Coordinator)
2. Ms. Sarita Tejawani, TGT (Science), KV Ujjain, Bhopal
3. Ms. Mamta Marwah, TGT (Science), St. Cecilia's School, Delhi

Social Science Section

1. Ms. Mohini B. Sampson, Principal, Ingraham School, Ghaziabad
2. Ms. Babita Chaudhary, PGT (History), GD, Goenka School, Ghaziabad
3. Mr. Amit Sharma, PGT (Geography), GD, Goenka School, Ghaziabad
4. Mr. Alwar Manoharan, PGT (Economics), KV, Teharan

Editing

1. Ms. Renu Anand



Contents

Preface

Acknowledgements

Project-Based Learning

1

Integrated Projects

19

Hindi

50

English

129

Mathematics

172

Science

220

Social Science

323