

*Mathematics Laboratory  
in Primary and  
Upper Primary Schools*

**CLASS III-VIII**



**CENTRAL BOARD OF SECONDARY EDUCATION**

**PREET VIHAR, DELHI - 110092**

**Mathematics Laboratory in Primary and Upper Primary Schools for Class 3rd - 8th**

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# Foreword

A major part of the formative years of a child's life is spent in a school and hence the importance of making it a place of joyous learning has been engaging the attention of educationists. The National Curriculum Framework 2005 has elaborated on the insights of Learning without Burden to ensure that a child is not taken away from the joy of being young by de-linking school knowledge from every day experience. One of the most important areas in this respect is regarding mathematics learning in schools.

Mathematical phobia has been a common jargon in school parlance that has created an elite class of good students of mathematics leaving behind a large number of students who fear the subject. In an endeavour to impress upon the schools that this misconception about the subject is mainly due to wrong teaching practices which do not link the subject with real life, the Board had introduced the concept of Mathematics Laboratory in schools up to Secondary level.

It is essential to know that mathematics is very much related with real life. It is a vehicle of communication just as every language is. Through mathematics we can describe, understand and work with physical phenomena with utmost precision. The subject has application in almost all walks of life. The symbols and operations are only mechanical tools but the concepts themselves are much more than these and are very much real and related to human life in the backdrop of the world we live in. But by projecting the subject as dealing with the world of symbols and notations it has been painted as an abstract subject much to be feared by students of limited capabilities. Mathematics laboratory as a concept will be an effective tool in the hands of a teacher to illustrate to the students that they can construct all mathematical knowledge with their own hands, enabling a smooth transition to abstract thinking capabilities.

CBSE has already introduced the concept of Mathematics laboratory for classes IX and X few years back in all its affiliated schools, where students are encouraged to learn the concepts through activity work and hands on experiences. With the success of this initiative, CBSE introduced the concept of Mathematics laboratory from classes III – VIII also, where actual understanding of basic concepts take place.

In 2008 vide circular no.38/08, CBSE had listed a number of activities for classes III – VIII, which could be taken up by the teachers while teaching a particular concept. The present document gives a detailed process for doing these activities. This would help the teachers as well students in actually doing these activities.

I take this opportunity to thank all experts and practicing teachers who have helped in the development of this material. I further acknowledge the contribution of Mrs. C. Gurumurthy, Director (Academic), CBSE, for providing necessary impetus and guidance. I would also put on record my appreciation for Dr. Srijata Das, Education Officer, for her efforts in completion and publication of this document.

Suggestions from users for further improvement of this document will be highly appreciated.

(Vineet Joshi)  
CHAIRMAN

# Acknowledgements

## ▶ *CBSE Advisors:*

---

<b>Sh. Vineet Joshi</b>	<i>Chairman</i>
<b>Smt. C. Gurumurthy,</b>	<i>Director Academic</i>

## ▶ *Developmental Team:*

---

<b>Sh. B.M. Gupta</b>	<i>Directorate of Education, Delhi.</i>
<b>Sh. C.B. Verma</b>	<i>DC Arya Sr. Sec. School, Lodhi Road, New Delhi</i>
<b>Mrs. Avantika Dam</b>	<i>CIE Basic School, Delhi University, Delhi</i>
<b>Mrs. Rashmi Kathuria</b>	<i>Kulachi Hans Raj Model School, Ashok Vihar, Delhi.</i>
<b>Mrs. Anjali Malik</b>	<i>CRPF Public School, Prashant Vihar, Delhi</i>
<b>Mrs. Deepti</b>	<i>CIE Basic School, Delhi University, Delhi</i>

## ▶ *Editorial Team*

---

<b>Prof. Ram Avtar</b>	<i>NCERT, Delhi</i>
<b>Prof. Dharam Prakash</b>	<i>NCERT, Delhi</i>
<b>Sh. J.C. Nijhawan</b>	<i>Directorate of Education, Delhi</i>
<b>Sh. B.M. Gupta</b>	<i>Directorate of Education, Delhi</i>

## ▶ *Member Coordinator :*

---

<b>Dr. Srijata Das</b>	<i>Education Officer, CBSE, Delhi</i>
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# 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 अखण्डता ] सुनिश्चित करने वाली बंधुता बढ़ाने के लिए दृढ़संकल्प 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 सामाजिक संस्कृति की गौरवशाली परंपरा का महत्त्व समझें और उसका परीक्षण करें;
- ( छ ) प्राकृतिक पर्यावरण की जिसके अंतर्गत वन, झील, नदी, और वन्य जीव हैं, रक्षा करे और उसका संवर्धन करें तथा प्राणिमात्र के प्रति दयाभाव रखे;
- ( ज ) वैज्ञानिक दृष्टिकोण, मानववाद और ज्ञानार्जन तथा सुधार की भावना का विकास करें;
- ( झ ) सार्वजनिक संपत्ति को सुरक्षित रखें और हिंसा से दूर रहें;
- ( ञ ) व्यक्तिगत और सामूहिक गतिविधियों के सभी क्षेत्रों में उत्कर्ष की ओर बढ़ने का सतत प्रयास करें जिससे राष्ट्र निरंतर बढ़ते हुए प्रयत्न और उपलब्धि की नई उंचाइयों को छू ले।

# 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 <sup>2</sup> [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.

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# Introduction

It is a common observation that a large section of student population considers mathematics to be a dull and difficult subject. This is because of being taught in a mechanical manner where students are made to memorize formulae/algorithms and apply these formulae algorithms in solving problems.

All this is creating a phobia in the minds of students towards this subject.

In order to appreciate the nature of mathematics and to make mathematics learning interesting and joyful, the teaching-learning process has to be completely revamped. The concept of mathematics laboratory has been introduced by CBSE few years back in Class IX and X. In 2008, CBSE extended this concept to Primary and Upper Primary classes by identifying specific activities for Classes III-VIII based on the concepts given in NCERT text books.

The present document gives detailed process for performing these activities. Care has been taken to ensure that the teachers and students are able to perform these activities with relative ease, requiring no expensive material.

It is hoped that teachers and students will perform these activities and make mathematics teaching-learning process a joyful one. These activities can be performed inside the classroom, homes or some corner/room in the school where materials are easily available to the students so that they can work with them, actively participate in the activity and consequently learn to appreciate and understand mathematics.

**Dr. Srijata Das**

*Education Officer, CBSE, Delhi*

