

# **Mathematics**

## **( Primary Level )**

### **Executive Summary**

The main goal of mathematics education in school is the mathematisation of the child's thought process through joyful learning. The children should learn to enjoy mathematics rather than fear it. They should pose and solve meaningful problems. Teacher should engage every child in the class.

Mathematics being a compulsory subject of study, access to quality mathematics education is every child's right. Mathematics education should be affordable as well as enjoyable. A culture of learning outside the classroom should be encouraged.

The syllabus of mathematics at 'Primary Level' was reviewed keeping in view the N.C.F. 2005 guidelines. Knowledge of the subject gained in school is to be linked with the child's everyday experiences. There is more focus on activities and exercises so that the learner feels encouraged to do them. Activities and exercises are such that they reflect thinking and reasoning. Learning should be shifted away from rote method and learning by doing should be encouraged. Syllabus follows from known to unknown, simple to complex, concrete to abstract and is child-centred and minimum level of learning of the child is kept in mind. Continuity from one level to another and from one class to another is maintained, e.g. Unit on 'Patterns' is included in the syllabus from class 1st to 5th. Interdisciplinary and thematic linkages are maintained as per N.C.F. guidelines e.g. Numbers/ days of the week, etc. are in Eng/ Hindi and Maths.

Mathematics should offer us logical thinking. When the child learns various approaches of problem-solving they come to know which approach is the best. Primary standard curriculum should be rich in such activities that

make transition to algebra easier. Following gaps were observed while reviewing the syllabus and accordingly the suggestions were made.

For class Ist 'Shapes and spatial understanding' topic is included in the syllabus to create awareness about surrounding and for joyful learning. Tables are included but only from 1 to 5 (orally) so as to prepare the child for multiplication in higher classes. Vocabulary of group of tens and ones as per N.C.F. is not included in the syllabus. Unit of patterns is included from class 1<sup>st</sup> to 5<sup>th</sup> syllabus as they help in developing mathematical thinking and reasoning powers.

From class II to VI 'Let us Revise' is introduced as Unit I in the syllabus at every stage because revision is a must before starting a new class particularly in mathematics. From class II we have incorporated place value of numbers, addition and subtraction of zero commutative property, multiplication by one and zero, as the students are mature enough to understand the concept of place value and concept of zero. By this stage the student is capable of addition and subtraction and must know that changing the order of no's does not affect the total sum. Inclusion of 3D shapes will make them familiar with the surroundings and will also help in maintaining continuity from class II to class III.

For class III multiplication tables from 16-20 are included and were deleted from class II to reduce the burden of class II child. Associative property of addition is introduced in class III as the child has learned commutative property in II<sup>nd</sup> class. Algebra is not introduced at class III level as it is above the mental level of students and also to reduce the burden of class III students as per N.C.F. This Unit is included at class IV level.

For class IV<sup>th</sup> International System of numeration, Roman Notation Area and Average are deleted at class IV level to reduce the burden of heavy syllabus and are introduced at class V<sup>th</sup>. Division by zero is not possible should be stressed by giving sufficient examples. H.C.F. of two numbers is

added after common factors in the syllabus. For multiplication and division of fractions calculation of no's must be encouraged wherever necessary at appropriate step. Knowledge of leap year is given. By measuring the angles of triangle the students must be able to draw conclusion that the sum of all angles of the triangle is  $180^{\circ}$ .

For class V<sup>th</sup> International system of numeration Roman Notation & Average are included in V<sup>th</sup> class by keeping in view the suggestions to reduce the work load & the syllabus in class IV as per N.C.F. guidelines. Only DMAS is included in the syllabus and 'BO' of BODMAS is deleted from V<sup>th</sup> & will be covered in VII<sup>th</sup> class Board syllabus. Ratio, and unit on speed, distance & time are deleted from V<sup>th</sup> class & will be introduced in VI<sup>th</sup> class Board syllabus as these units are above the mental level of the students. Exponents & Radicals is deleted from V<sup>th</sup> class & will be covered in VII<sup>th</sup> class.

From the unit of Angles, Vertically opposite angles, alternate angles, corresponding angles, interior opposite angles are deleted from V<sup>th</sup> class & will be covered in VI<sup>th</sup> class along with parallel lines & transversal. Area of right angled triangle is deleted from the unit of Area and will be included in VI<sup>th</sup> class. As the right angled triangle is a special case of triangle so it will be discussed in VI<sup>th</sup> class as a separate chapter. Unit on volume is deleted from V<sup>th</sup> class & will be included in VII<sup>th</sup> class as the concept of 3-D figures & its volume is typical & above the level of class V students.

Evaluation pattern will be both oral as well as written activity-based in classes I, II & III and exercises based for classes IV & V. The evaluation should be periodic and continuous. Evaluation by observation, interaction with teacher and among the peer group.

Expected outcome of this syllabus reviewing is that after completion of Primary Education (class I to V) the child/ learner must be able to-  
Read & write numbers upto 10 crore and their fundamental operations.  
Develop understanding of standard algorithm of multiplication & division.  
Appreciate the need for the standard units of measurement.

- Familiar with fractions, decimals no. and their operation.
- Knowledge of Indian Currency.
- Perimeter and area of a square, rectangle, triangle.
- Basic concept of percentage, Average and ratio are clear.
- Solve problems related to simple interest, profit and loss of daily life.
- Think logically and decide for him/her self which approach is the best.
- Link knowledge of school to outside world.

Our vision of excellent mathematical education is based on twin premises that all students can learn mathematics and that all students need to learn mathematics. It is therefore imperative that we offer mathematics education of the very highest quality to all children.

## **Objectives**

- Main goal of mathematics education in school is the Mathematisation of child's thought process through joyful learning.
- To develop useful capabilities pertaining to numbers (Numerical ability)
- To pursue assumption to their logical conclusion.
- Child should be in a position to know which approach is best for him/her for problem solving.
- To allow the child to articulate his/her reasons behind doing a particular exercise.
- To nurture mathematical thinking and systematic reasoning.
- To observe relationships and to find connections.

## **Objectives (Class – I)**

- Learning through play.
- To help child develop positive attitude and liking towards mathematics through puzzles, stories and poems.
- To develop the vocabulary of the spatial relationship.
- Developing a sense of number and ability of counting using real objects sun, moon, etc. from surroundings.
- To develop awareness about shape, size, colour through surroundings.

## **Objectives (Class – II)**

- To create clarity of the concepts of counting and fundamental operations of addition and subtraction.
- To develop awareness for the fundamental use of operation of addition and subtraction in different situations in daily life.
- To impart knowledge of whole and part of a real object.
- To identify common currency notes and coins.
- To nurture mathematical reasoning.

## **Objectives (Class – III)**

- To co-relate addition and subtraction in everyday life.
- To create efficiency in multiplication to face everyday life situations.
- Understanding of standard algorithm of division and to co-relate division with multiplication.
- To impart knowledge of fractions through whole and part of an object and use it in different situations.
- To appreciate the need for the standard units of measurement.
- To develop understanding of space and time in everyday life.
- To identify simple symmetrical shapes and patterns.

### **Objectives (Class – IV)**

- To make them familiar with different type of numbers. (prime numbers, even & odd numbers)
- To introduce them with fractions and their fundamental operations.
- To explain unitary method and its importance in practical life.
- To clear the concept of Decimal Number.
- To make students aware with the measurement of length, weight and volume and with their units.
- To impart knowledge of Indian currency and capability to handle transactions in practical life.
- To introduce them to some mathematical terms like Perimeter and Area.

## **Objectives (Class – V)**

- To introduce them with the basic concept of percentage, Average and their use.
- To introduce them to the concept of exponents and radicals.
- To enable them to acquire ability to solve problems related to simple interest, Profit and Loss and to use it in daily life situations.
- To arouse their interest and curiosity in geometrical facts and figures.
- To inspire critical thinking and widen their scope in problem solving of algebraic expressions.

## **Expected Outcome**

By the end of the class I, the child will be able to develop the vocabulary of spatial relationships top-bottom, on-under, far-near etc. A sense of number ness will be developed and he/she may be able to read and write numbers from 1 to 100 and develop the ability of counting using real objects sun, moon, etc. The child will be aware about shape, size, colour of various objects in his surroundings.

By the end of class II, the concept of counting and fundamental operations of Addition, Subtraction to the child will be made clear. He/she will develop awareness of use of fundamental operations of addition and subtraction in different situations in everyday life. He/she will have knowledge of whole and part of a real object and will be able to identify common currency notes and coins.

By the end of class III, the child will be able to co-relate addition and subtraction with everyday life. He/she will understand and will be efficient in standard algorithm of Multiplication and Division and co-relate division with

multiplication. He/she will appreciate the need for the standard units of measurement and will develop understanding of space and time in everyday life.

By the end of class IV, the child will be familiar with different types of numbers (Prime, even and odd numbers). He/she will be well versed with the fractions and decimal numbers and their fundamental operations. He/she will have knowledge of unitary method and its importance in practical life. He/she will be aware with the measurement of length, weight and volume and with their units. He/she will be introduced with mathematical terms like perimeter and area and will be able to solve related problems.

By the end of class V, the child will have understanding of basic concepts of percentage, Average, and their uses,. He/she will be able to solve problems related to Simple Interest, Profit and Loss and will be able to use it in daily life situations. The child will be able to think critically and their scope in problem solving through algebraic expressions will be widened.