

REVISED SYLLABUS BY CBSE
On date (24-07-2021)
SHIVALIK PUBLIC SCHOOL
MATHEMATICS - X
(CODE NO. 041)
Session 2021-22

Term-wise Syllabus

The Syllabus in the subject of Mathematics has undergone changes from time to time in accordance with growth of the subject and emerging needs of the society. The present revised syllabus has been designed in accordance with National Curriculum Framework 2005 and as per guidelines given in the Focus Group on Teaching of Mathematics which is to meet the emerging needs of all categories of students. For motivating the teacher to relate the topics to real life problems and other subject areas, greater emphasis has been laid on applications of various concepts. The curriculum at Secondary stage primarily aims at enhancing the capacity of students to employ Mathematics in solving day-to-day life problems and studying the subject as a separate discipline. It is expected that students should acquire the ability to solve problems using algebraic methods and apply the knowledge of simple trigonometry to solve problems of height and distances. Carrying out experiments with numbers and forms of geometry, framing hypothesis and verifying these with further observations form inherent part of Mathematics learning at this stage. The proposed curriculum includes the study of number system, algebra, geometry, trigonometry, mensuration, statistics, graphs and coordinate geometry, etc. The teaching of Mathematics should be imparted through activities which may involve the use of concrete materials, models, patterns, charts, pictures, posters, games, puzzles and experiments.

Objectives

The broad objectives of teaching of Mathematics at secondary stage are to help the learners to:

- consolidate the Mathematical knowledge and skills acquired at the upper primary stage;
- acquire knowledge and understanding, particularly by way of motivation and visualization, of basic concepts, terms, principles and symbols and underlying processes and skills;
- develop mastery of basic algebraic skills;
- develop drawing skills;
- feel the flow of reason while proving a result or solving a problem;
 - apply the knowledge and skills acquired to solve problems and wherever possible, by more than one method;
- to develop ability to think, analyze and articulate logically;
- to develop awareness of the need for national integration, protection of environment, observance of small family norms, removal of social barriers, elimination of gender biases;
- to develop necessary skills to work with modern technological devices and mathematical software's.
- to develop interest in mathematics as a problem-solving tool in various fields for its beautiful structures and patterns, etc.
 - to develop reverence and respect towards great Mathematicians for their contributions to the field of Mathematics;

- to develop interest in the subject by participating in related competitions;
- to acquaint students with different aspects of Mathematics used in daily life;
- to develop an interest in students to study Mathematics as a discipline.

COURSE STRUCTURE

CLASS –X (2021-22)

FIRST TERM

One Paper

90 Minutes

NO.	UNIT NAME	MARKS
I	NUMBER SYSTEMS	6
II	ALGEBRA	10
III	COORDINATE GEOMETRY	6
IV	GEOMETRY	6
V	TRIGONOMETRY	5
VI	MENSURATION	4
VII	STATISTICS & PROBABILITY	3
	Total	40
	INTERNAL ASSESSMENT	10
	TOTAL	50

COURSE STRUCTURE CLASS –X TO BE FOLLOWED IN SCHOOL

FIRST TERM

UNITS	CHAPTER NUMBER	CHAPTER NAME	DAYS REQUIRED
I	CHAPTER 1	REAL NUMBER	8
II	CHAPTER 2	POLYNOMIALS	11
	CHAPTER-15	PROBABILITY	3
III	CHAPTER-3	PAIR OF LINEAR EQUATIONS IN TWO VARIABLES	12
	CHAPTER-7	COORDINATE GEOMETRY	6
IV	CHAPTER-8	INTRODUCTION TO TRIGONOMETRY	7
	CHAPTER-12	AREAS RELATED TO CIRCLES	8
V	CHAPTER-6	TRIANGLES	9

FIRST TERM

UNIT-I

CHAPTER 1: REAL NUMBERS (UNIT-NUMBER SYSTEMS)

KEY WORDS: Fundamental Theorem of Arithmetic, Terminating decimal expansions, Non-terminating repeating (recurring) decimal expansions, Non-terminating non-repeating (recurring) decimal expansions

CONTENTS: Fundamental Theorem of Arithmetic - statements after reviewing work done earlier and after illustrating and motivating through examples. Decimal representation of rational numbers in terms of terminating/non-terminating recurring decimals.

ACTIVITY 1.- To find HCF of two numbers experimentally based on Euclid's Division Lemma.

UNIT-II

CHAPTER 2: POLYNOMIALS (UNIT-ALGEBRA)

KEY WORDS: Polynomial, Degree of polynomial, Constant polynomial, Linear polynomial, Quadratic polynomial, Cubic polynomial, Zero of a polynomial.

CONTENTS: Zeroes of a polynomial. Relationship between zeroes and coefficients of quadratic polynomials only.

ACTIVITY 2.- To draw the graph of a quadratic polynomial and observe .

- (i) The shape of the curve when the coefficient of x^2 is positive.
- (ii) The shape of the curve when the coefficient of x^2 is negative.
- (iii) Its number of zeroes.

CHAPTER 15: PROBABILITY (UNIT- STATISTICS & PROBABILITY)

KEY WORDS: Probability, Random experiment, Elementary Event, Sure Event, Impossible Event, Equally likely outcomes.

CONTENTS: Classical definition of probability. Simple problems on finding the probability of an event.

1.MULTIPLE ASSESSMENT –: CROSSWORD PUZZLE

UNIT-III

CHAPTER 3: PAIR OF LINEAR EQUATIONS IN TWO VARIABLES (UNIT-ALGEBRA)

KEY WORDS: Linear Equation, Solution of linear equation, Consistent system, Inconsistent system, Substitution method, Elimination method,

CONTENTS: Pair of linear equations in two variables and graphical method of their solution, consistency/inconsistency. Algebraic conditions for number of solutions. Solution of a pair of linear equations in two variables algebraically - by substitution and

by elimination . Simple situational problems. Simple problems on equations reducible to linear equations.

ACTIVITY 3.- To verify the conditions for consistency of a system of linear equations in two variables by graphical representation.

CHAPTER 7: COORDINATE GEOMETRY (UNIT-COORDINATE GEOMETRY)

KEY WORDS: X-axis, Y-axis, Origin, Point and its coordinates, Distance formula, Section formula, Mid-point formula, Centroid of triangle and its coordinates,

CONTENTS: LINES (In two-dimensions)

Review: Concepts of coordinate geometry, graphs of linear equations. Distance formula. Section formula (internal division)

ACTIVITY 4.- To verify the distance formula by graphical method.

UNIT-IV

CHAPTER 8 : . INTRODUCTION TO TRIGONOMETRY (UNIT- TRIGONOMETRY)

KEY WORDS: Trigonometric ratios, Values of the trigonometric ratios, Trigonometric Identities

CONTENTS: Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence (well defined). Values of the trigonometric ratios of 30° , 45° and 60° . Relationships between the ratios.

TRIGONOMETRIC IDENTITIES : Proof and applications of the identity

$\sin^2 A + \cos^2 A = 1$. Only simple identities to be given

2. MULTIPUL ASSESSMENT –: CROSSWORD PUZZLE

CHAPTER 12: AREAS RELATED TO CIRCLES (UNIT-MENSURATION)

KEY WORDS: Segment of circle, Sector of circle, Concentric circles, Perimeter of circle, Length of arc, Areas of circle, semicircle, quadrant, sector, segment.

CONTENTS: Motivate the area of a circle; area of sectors and segments of a circle.

Problems based on areas and perimeter / circumference of the above said plane figures. (In calculating area of segment of a circle, problems should be restricted to central angle of 60° and 90° only. Plane figures involving triangles, simple quadrilaterals and circle should be taken.)

ACTIVITY 5. -To obtain the formula for area of the circle i.e., πr^2 by paper cutting and pasting method.

UNIT-V

CHAPTER 6: TRIANGLES (UNIT-GEOMETRY)

KEY WORDS: Triangle and its types, similar figures and similar triangles, Basic Proportionality Theorem, Area-Ratio theorem, Pythagoras Theorem, Similarity Criterion(AA, SSS, SAS, AAA, RHS)

CONTENTS: Definitions, examples, counter examples of similar triangles.

1.**(Prove)** If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

2.**(Motivate)** If a line divides two sides of a triangle in the same ratio, the line is parallel to the third side.

3.**(Motivate)** If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar.

4.**(Motivate)** If the corresponding sides of two triangles are proportional, their corresponding angles are equal and the two triangles are similar.

5.**(Motivate)** If one angle of a triangle is equal to one angle of another triangle and the sides including these angles are proportional, the two triangles are similar.

6.**(Motivate)** If a perpendicular is drawn from the vertex of the right angle of a right triangle to the hypotenuse, the triangles on each side of the perpendicular are similar to the whole triangle and to each other.

7.**(Motivate)** The ratio of the areas of two similar triangles is equal to the ratio of the squares of their corresponding sides.

8.**(Prove)** In a right triangle, the square on the hypotenuse is equal to the sum of the squares on the other two sides.

9.**(Motivate)** In a triangle, if the square on one side is equal to sum of the squares on the other two sides, the angle opposite to the first side is a right angle

ACTIVITY 6.-(i)To verify the basic proportionality theorem by using parallel lines board, triangle cut outs.

OR

(ii) To verify Pythagoras theorem by performing an activity.

INTERNAL ASSESSMENT	MARKS	TOTAL MARKS
Periodic Tests	3	10 marks for the term
Multiple Assessments	2	
Portfolio	2	
Student Enrichment Activities-practical work	3	

SECOND TERM

NO.	UNIT NAME	MARKS
I	ALGEBRA(Cont.)	10
II	GEOMETRY(Cont.)	9
III	TRIGONOMETRY(Cont.)	7
IV	MENSURATION(Cont.)	6
V	STATISTICS & PROBABILITY(Cont.)	8
	Total	40
	INTERNAL ASSESSMENT	10
	TOTAL	50

SECOND TERM

UNITS	CHAPTER NUMBER	CHAPTER NAME	DAYS REQUIRED
VI	CHAPTER-4	QUADRATIC EQUATIONS	8
	CHAPTER-5	ARITHMETIC PROGRESSIONS	8
VII	CHAPTER-9	SOME APPLICATIONS OF TRIGONOMETRY	5
VIII	CHAPTER-10	CIRCLES	5
	CHAPTER-11	CONSTRUCTIONS	4
IX	CHAPTER-13	SURFACE AREAS AND VOLUMES	6
X	CHAPTER-14	STATISTICS	5

SECOND TERM

UNIT-VI

CHAPTER 4: QUADRATIC EQUATIONS (UNIT-ALGEBRA)

KEY WORDS: Quadratic Equation, Zeroes or roots of quadratic equation, Discriminant, Nature of roots.

CONTENTS: Standard form of a quadratic equation $ax^2 + bx + c = 0$, ($a \neq 0$) Solutions of quadratic equations (only real roots) by factorization, and by using quadratic formula. Relationship between discriminant and nature of roots. Situational problems based on quadratic equations related to day to day activities (problems on equations reducible to quadratic equations are excluded)

1.MULTIPUL ASSESSMENT –: CROSSWORD PUZZLE

CHAPTER 5: ARITHMETIC PROGRESSIONS (UNIT-ALGEBRA)

KEY WORDS: Progression, Arithmetic Progression, Common difference, Terms, nth term of A.P., Sum of n terms of A.P

CONTENTS: Motivation for studying Arithmetic Progression Derivation of the nth term and sum of the first n terms of A.P. and their application in solving daily life problems. (Applications based on sum to n terms of an A.P. are excluded)

ACTIVITY 7. -To identify Arithmetic Progressions in some given lists of numbers (patterns).

UNIT-VII

CHAPTER 9: APPLICATIONS OF TRIGONOMETRY (UNIT- TRIGONOMETRY) (HEIGHTS AND DISTANCES)

KEY WORDS: Height, Distance, Line of sight, Angle of elevation, Angle of depression, Clinometer.

CONTENTS: Angle of elevation, Angle of Depression. Simple problems on heights and distances. Problems should not involve more than two right triangles. Angles of elevation / depression should be only 30° , 45° , 60° .

ACTIVITY 8.-To find the height of a building using a clinometer.

UNIT-VIII

CHAPTER 10: CIRCLES (UNIT- GEOMETRY)

KEY WORDS: Circle and its related terms, Secant, Tangent, Length of tangent, Interior and exterior of circle.

CONTENTS: Tangent to a circle at, point of contact

1. (Prove) The tangent at any point of a circle is perpendicular to the radius through the point of contact.
2. (Prove) The lengths of tangents drawn from an external point to a circle are equal.

ACTIVITY 9.-1.To verify experimentally that the tangent at any point to a circle is perpendicular to the radius through that point.

2.To verify that the lengths of tangents to a circle from some external point are equal.

CHAPTER 11: CONSTRUCTIONS (UNIT- GEOMETRY)

KEY WORDS: Line segment, Acute angle, Similar triangle, Corresponding sides, Perpendicular bisector of chord, Tangent to circle.

CONTENTS: 1. Division of a line segment in a given ratio (internally).

2. Tangents to a circle from a point outside it.

2.MULTIPUL ASSESSMENT –: CROSSWORD PUZZLE

UNIT-IX

CHAPTER 13: SURFACE AREAS AND VOLUMES (UNIT-MENSURATION)

KEY WORDS: Polyhedron, Cuboid, Cube, Cylinder, Cone, Sphere, Hemisphere, Spherical shell, hemispherical shell, Surface area and volume of each solid written above.

CONTENTS: 1. Surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones.

2. Problems involving converting one type of metallic solid into another and other mixed problems. (Problems with combination of not more than two different solids be taken).

ACTIVITY 10.- To find the curved surface area and total surface area of a cylinder experimentally.

UNIT-X

CHAPTER 14: STATISTICS (UNIT- STATISTICS & PROBABILITY)

KEY WORDS: Data, Grouped, Data, Ungrouped, Data, Mean, Mode, Median,

CONTENTS: Mean, median and mode of grouped data (bimodal situation to be avoided). Mean by Direct Method and Assumed Mean Method only .

3. MULTIPUL ASSESSMENT –: CROSSWORD PUZZLE

INTERNAL ASSESSMENT	MARKS	TOTAL MARKS
Periodic Tests	3	10 marks for the term
Multiple Assessments	2	
Portfolio	2	
Student Enrichment Activities-practical work	3	

PRESCRIBED BOOKS:

- 1. Mathematics - Textbook for class X - NCERT Publication**
- 2. Guidelines for Mathematics Laboratory in Schools, class X - CBSE Publication**
- 3. Laboratory Manual - Mathematics, secondary stage - NCERT Publication**
- 4. Mathematics exemplar problems for class X, NCERT publication.**