

The curriculum is structured to build competencies in Number Theory, Algebra, Geometry, Data Handling, and Problem-Solving Strategies.

1. Number Theory

Objectives:

- Understand and perform operations with integers, fractions, decimals, and percentages.
- Identify prime numbers, factors, and work with ratios, proportions, LCM, and GCD.
- Understand rational and irrational numbers, and solve problems involving exponents and square roots.

Topics:

- Prime Numbers, Composite Numbers, and Factorization
- Least Common Multiple (LCM) and Greatest Common Divisor (GCD)
- Fractions, Decimals, and Percentages
- Ratios, Proportions, Rational, and Irrational Numbers
- Exponents and Square Roots

Activities:

- Prime factorization exercises
 - LCM and GCD problem sets
 - Fraction, decimal, and percentage operations practice
 - Ratio and proportion problem-solving
 - Solving problems involving exponents and roots
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2. Algebra

Objectives:

- Simplify and evaluate algebraic expressions.
- Solve linear and quadratic equations, as well as inequalities.
- Recognize patterns and sequences, and understand functions.

Topics:

- Algebraic Expressions and Simplification
- Solving Simple Linear and Quadratic Equations
- Linear Inequalities and Graphing

- Patterns and Sequences (Arithmetic Sequences)
- Polynomials, Factorization, Functions, and Graphs

Activities:

- Solve linear and quadratic equations, and graph their solutions
 - Simplify complex algebraic expressions
 - Explore patterns and sequences with visual aids and manipulatives
 - Factor polynomials and solve related problems
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3. Geometry

Objectives:

- Recognize and apply properties of geometric shapes, including triangles, quadrilaterals, and circles.
- Calculate perimeter, area, surface area, and volume of various shapes.
- Understand and apply theorems related to triangles, circles, and coordinate geometry.

Topics:

- Properties of Rectangles, Squares, Triangles, and Circles
- Perimeter, Area, Surface Area, and Volume Calculations
- Introduction to Angles (Acute, Obtuse, Right)
- Theorems Related to Triangles and Circles
- Coordinate Geometry (Plotting Points, Slopes)

Activities:

- Draw, measure, and solve problems involving geometric shapes
 - Calculate area, perimeter, and volume using real-life scenarios
 - Apply geometric theorems to solve problems
 - Practice plotting and analyzing points on a coordinate plane
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4. Data Handling

Objectives:

- Organize, interpret, and analyze data using various graphs and charts.
- Calculate measures of central tendency and understand basic to advanced probability concepts.

Topics:

- Collecting Data, Creating Bar Graphs, Pictographs, and Line Graphs
- Measures of Central Tendency (Mean, Median, Mode)
- Data Interpretation from Complex Graphs (e.g., Pie Charts)
- Measures of Dispersion (Standard Deviation)
- Probability Concepts (Basic to Advanced)

Activities:

- Create and interpret bar graphs, line graphs, and pie charts
 - Analyze data sets to find mean, median, mode, and standard deviation
 - Solve basic and advanced probability problems
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5. Problem-Solving Strategies

Objectives:

- Apply logical reasoning and develop strategies for complex problem-solving.
- Prepare for Olympiad-style questions through advanced practice.

Topics:

- Logic Puzzles and Riddles
- Introduction to and Advanced Mathematical Proofs
- Mathematical Reasoning Techniques
- Olympiad-style Problem Sets

Activities:

- Solve logic puzzles and work on advanced problem sets
 - Practice mathematical proofs with guided examples
 - Participate in mock Olympiad exams
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Textbooks: Aligned with all Pakistan Text Board curricula.

Online Platforms: [Art of Problem Solving](#) for interactive exercises and practice tests.