



Mathematics Enrichment Programs for Home School Students Grades 4 to 8

Fun Math Club mathematics enrichment programs consist of a series of one-hour class meetings. Each meeting presents an engaging activity that enriches students' mathematics experience and teaches and exercises basic math skills. The topics in each program focus on a particular domains from the *California Common Core State Standards: Mathematics*. All activities in the program develop skills in the Mathematical Practices¹ put forth in the standards.

Class starts with a short lecture about the day's topic followed by time for students to work on problem worksheets and projects. During the hour of class, there may be several points at which a dialogue is held to review progress and discuss solutions to the problems. Students may be given short homework questions to explore outside of the class. The answers to the homework are discussed at the beginning of the next class.

Class size is limited to twenty students. Two grade levels may be combined in a single program. The number of classes in standard programs is shown below, but it is possible to customize programs of shorter or longer durations. School or sponsor must provide classroom facility.

Programs Offered

Fun Math Club offers three different programs. The programs are designed for a series of ten weekly classes but the duration may be changed meet a site's schedule constraints.

Note: Specific program topics are subject to change based on program duration and student progress in the classroom. The lessons below are a sampling of lessons chosen for a particular program.

Logic and Problem Solving

Topics presented focus on the domains of Counting and Cardinality, Operations and Algebraic Thinking, and Number and Operations in Base Ten.

1. Frog Jumping: solve a puzzle to find some easy and not-so-easy number patterns
2. Dominoes and Seashells: discover Fibonacci numbers and their relation to seashells
3. Numbers and Polygons: learn about triangular, square, and other number patterns
4. Latin Squares: learn about the origins of Sudoku and create art designs.
5. The Census Taker: solve some puzzles using deductive reasoning
6. Venn Diagrams: solve problems using Venn diagrams in a group activity

¹ Common Core Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

7. Silly Syllogisms: learn about deductive logic
8. True or False, Valid or Invalid: solve logic problems and learn about logical inference
9. The Candymaster: solve a series of classic logic problems and make up one too
10. The Monty Hall Dilemma: solve a logic problem where intuition is wrong

Numbers and Geometry

Topics presented focus on the conceptual categories of Number and Quantity, Algebra, Functions, and Geometry.

1. Tetromino Puzzles: solve tetromino puzzles and learn about area.
2. Pentominoes and Area: explore areas of irregular shapes using pentominoes.
3. Lines of Symmetry: learn about reflective and rotational symmetry.
4. Palindromes: explore symmetry in words and numbers.
5. Linear of Symmetry: learn about the seven linear symmetries.
6. Triangulum: explore a world where the triangle is the most common polygon
7. Numbergons: Discover patterns while solving number puzzles on polygons.
8. Magic Hexagon: Solve a hexagon number puzzle that took the first person to solve it 40 years.
9. Hexagon Art: Learn to draw a regular hexagon using a compass and create hexagon art and optical illusions.
10. Cubes: discover many ways one can fold a cube.
11. Cubes Cubed: learn how to draw cubes and solve polycube puzzles
12. Polyhedrons: learn about polyhedrons and number patterns

Numbers, Data, and Chance

Topics presented focus on the domains of Counting and Cardinality, Ratios and Proportional Relationships, and Statistics and Probability.

1. Magic Number Squares: solve a two-dimensional number pattern puzzle
2. Prime Time: explore prime numbers
3. Magic of 9: learn about divisibility properties and make a magic trick
4. Magic Sums: learn how to use the commutative and associative properties of addition
5. Bars and Pies: graph data about the class
6. The Human Histogram: learn about frequency and histograms
7. Numb Numbers: explore some entertaining statistics
8. Roller Derby Dice: find a strategy for a dice game by using a histogram
9. Native American Dice: design a game modeled after a Native American dice game
10. Deal or No Deal: learn about averages and expected value

For more information contact:



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