

ACE Academy Advanced Math Curriculum

Advanced Math is an online small-group course (3–6 students) for elementary school students. Based on the North American–adapted Singapore math curriculum, it builds a strong foundation for logical thinking and problem-solving skills while fostering curiosity, confidence, and a love to tackle new challenges.



 						
Level	Level 3&4	Level 5&6	Level 7&8	Level 9&10	Level 11&12	Honors & Competition Math
Grade	Lower Grades		Higher Grades			Middle School
Goal	• Establish good learning routines • Build logical thinking habits • Develop fundamental problem-solving skills		• Bridge and progress • Deepen mathematical thinking • Tackle increasingly complex problems	• Strengthen learning methods and skills • Solve complex word problems • Enhance analytical and problem-solving abilities	• Enhance calculation skills • Strengthen spatial and geometric reasoning • Advance to intensive stage	• Comprehensive understanding and application • Excel in school and prepare for AP, SAT, and math competitions
Core Knowledge Points	• Addition and Subtraction • Intro to Multiplication and Division • Basic Concepts of Fractions • Recognition, Classification, and Construction of Plane Figures • Nonstandard Measurement and Length Comparison • Understanding and Applying Time and Money	• Vertical and Mental Addition / Subtraction • Basic Multiplication and Division • Four Operations and Real-Life Applications • Polygons, Semicircles, Quarter Circles, and 3D Figures • Measurement in Daily Life: Units of Length, Weight, and Capacity • Money and Related Calculations • Reading Clocks and Applying Time in Daily Life	• Numbers up to 10,000: Vertical and Mental Operations • Addition and Subtraction of Fractions • Circles and Angles; Triangles, Quadrilaterals, Perimeter and Area of Rectangles and Composite Figures • Units and Conversions of Length, Weight, and Capacity • Addition and Subtraction for Time and Money • Time Interval Problems • Shapes, Charts, and Bar Graphs	• Numbers to 1,000,000: Vertical and Mental Operations • Decimal Calculations • Multiplication and Division of Fractions; Improper Fractions and Mixed Numbers • Number Theory: Factors, Multiples, and Prime Numbers • Measurement and Calculation of Angles • Advanced Perimeter and Area of Rectangles and Composite Figures; Spatial Relationships • Unit Conversion and Fractions • Line Graphs and Frequency Charts	• Order of Operations and Properties of Operations • Four Operations with Fractions • Advanced Decimal Calculations • Understanding and Applying Ratios, Rates, and Percentages • Triangle Theorems; Angles in Polygons; Volume and Capacity of Solid Figures; Area of Triangles and Composite Figures • Coordinates and the Coordinate System • Averages, Line Graphs, and Data Analysis	• The Honors Math and Competition Math programs each have independent curricula. • The Honors Math covers core modules including Pre-Algebra, Algebra I, and Geometry. • The Math Competition is designed for math competitions such as AMC 8/10 and AIME.
Learning Outcomes	• 16 Core School Topics • 14 Enrichment Modules • 12 Key Competition Topics	• 14 Core School Topics • 13 Enrichment Modules • 11 Key Competition Topics	• 14 Core School Topics • 15 Enrichment Modules • 14 Key Competition Topics	• 19 Core School Topics • 18 Enrichment Modules • 19 Key Competition Topics	• 15 Core School Topics • 17 Enrichment Modules • 18 Key Competition Topics	• 75 Essential Honors-Level Topics • 48 Key Competition Topics • 8 Core Problem-Solving Methods
Thinking and Core Competencies	• Concrete Thinking • Visual Thinking • Analytical Thinking • Estimation Skills • Application Skills	• Analytical Thinking • Abstract Thinking • Modeling Skills • Deductive Reasoning • Complex Information Processing Skills	• Orderly Thinking • Recursive Thinking • Reverse Thinking • Spatial Reasoning • Application Skills	• Abstract Thinking • Creative Thinking • Data Analysis Skills • Summarize and Generalize • Spatial Reasoning	• Algebraic Thinking • Reverse Thinking • Spatial Reasoning • Comparative Thinking • Abstract Mathematical Representation Skills	• Integration of Numbers and Figures • Case Analysis Thinking • Proof and Proof by Contradiction • Derivation of Cyclical Patterns • Ability to Construct Auxiliary Lines in Geometric Figures
Problem-Solving Methods	• Drawing Method • Listing Method • Demonstration Method • Conjecture and Verification	• Drawing • Listing • Assumption • Step-by-Step Analysis	• Drawing • Formula • Assumption • Step-by-Step Analysis • Before-and-After Comparison • Cut-and-Rearrange	• Drawing • Assumption • Step-by-Step Analysis • Problem Reframing • Cut-and-Rearrange • Reverse Reconstruction	• Drawing • Formula • Step-by-Step Analysis • Problem Reframing • Case Analysis • Geometric Transformations	• Equation • Case Analysis • Drawing • Listing • Formula • Inductive Reasoning • Analogical Reasoning • Geometric Transformations

Spiral Curriculum Design

The curriculum follows a spiral structure, where key concepts are revisited and expanded across each level. This progressive approach ensures students build a solid foundation while being fully prepared for advanced learning.