Think Academy

Pre K Fall Syllabus



	Topic	Knowledge Point	Content	Ability
1	Zoo Locations	Working Memory	This course covers Image Memory and Spatial Memory techniques. Learn the method of repetition for enhancing image retention and a combination of repetition and vivid association to master spatial memory. Boost your memory skills effectively through practical strategies.	Reasoning
2	Little Painter	Lines	Explore and distinguish between straight and curved lines. Us different lines creatively to draw the pictures. Students will discover how points connect to form lines and how lines develop into shapes.	Spatial Sense
3	City Adventure	Parallel Lines	Find parallel lines in daily life and learn what parallelism means. Students can find parallel lines for a given line and identify parallels within shapes.	Spatial Sense
4	Squary's Farm	Equally Divide	Engage students in an activity where they divide animals into equal groups and find matching sets. Students will explore and learn the method of equal distribution through hands-on practice, understand the meaning of equal distribution.	Number
5	Unforgettable Trip	Pattern	Explore patterns, starting with repeating groups of three objects. Students will also learn about patterns where the end connects to the beginning.	Reasoning
6	Rainforest	Count by Group	Based on the children's understanding of large numbers, gradually transit from counting individual numbers to counting as groups, such as counting by fives, tens, etc., to improve counting speed, and lead children to explore various counting methods, enhancing their sense of numbers.	Number
7	Fruit Party	Measure and Compare	Engage in measuring the lengths of both curved and straight lines. Additionally, students will use various tools to assess the sizes of surfaces.	Measurement and Data
8	Special Twins	Symmetry	Fold along a "special line" to see perfect overlaps, and find symmetrical halves of shapes to understand symmetry.	Spatial Sense
9	Insect World	Whole and Parts	Explore number bonds through visual diagrams, helping students understand the concept of wholes and parts. Students will understand the relationship between the whole and parts in the number bonds.	Number
10	Little Handyman	Divide Shapes	Participate in hands-on projects, and learn to evenly divide various shapes. Students will explore methods of dividing shapes and quantities after trying it out.	Creativity
11	Field Trip	Ordinal Numbers	Learn and use ordinal numbers to describe specific positions. Students will understand the differences of ordinal numbers in different directions.	Spatial Sense
12	Lucky Ring	Left and Right	Recognize the left and right directions, and the left and right positions of objects. Students will be able to tell the left and right directions in life scenes, and place objects according to the given positions.	Expression
13	Let's Make Cakes	Addition in 10	Explore "total" of objects in life and solve the problems with the method of continuing counting. Students will describe the change in quantity with addition expressions using plus and equal signs, and solve addition problems within 10.	Number
14	Ask Elves	Row and Column	Understand the position of the row and column, locate the position in the row and column according to the position words and ordinal numbers. Solve the problem of "finding the place" in life.	Spatial Sense
15	Popping Candy	Find the Difference	Place and compare identical objects within a grid layout. Students will search for differences between items, compare and observe with their fingers one by one, search for targets, and gradually transition to eye observation and search.	Reasoning

Think Academy

Kindergarten Fall Syllabus



	Topic	Knowledge Point	Content	Ability
1	**Picky Bin**	**Classification in Different Ways**	Examine items from multiple perspectives to identify the most distinctive one. Students will be able to classify items based on varied criteria.	**Reasoning**
2	**Brothers Who Like to Compare**	**More or Fewer**	Participate in interactive challenges to compare quantities within groups. Students will compare two groups of objects and learn to solve real-life comparison problems by drawing the pictures.	**Number**
3	**Yummy Gifts**	**Plane Shapes**	Categorize and count various shapes. Students will recognize and differentiate between rectangles and squares.	**Spatial Sense**
4	**The Fruit Market**	**Skip Counting**	Learn skip-counting and find the way to group numbers to count fast independently. This enhances students' numerical pattern recognition.	**Number**
5	**Math on the Calendar**	**Calendar**	Explore calendars to learn about months and days of the week. Students will identify the dates on the calendar and discover patterns.	**Measurement and Data**
6	**Jewelry Shop**	**Pattern in Quantity**	Investigate patterns based on color, quantity, size, and type, including complex combinations. Students will recognize and predict patterns across various categories.	**Reasoning**
7	**Secrets in Numbers**	**Numbers in 100**	Use a number chart to count up to 100, both forwards and backwards. Students will learn to identify and understand relationships between neighboring numbers.	**Number**
8	**The Worries of Mommy Kangaroo**	**Dividing Shapes**	Engage in activities to divide plane shapes into equal parts and identify any excess sections. Students will enhance their spatial sense by dividing shapes into equal parts and dividing irregular shapes.	**Spatial Sense**
9	**Adventure to Addville**	**Addition in 20**	Review addition within 10 and understand digit place. Students will practice simple calculations within 20 using column addition.	**Number**
10	**Our Green Friends**	**Plants and Habitats**	Investigate plant adaptations to their environments. Students will learn about the vital functions of leaves in water retention and photosynthesis. By matching plants with their suitable environments, they gain insights into species' adaptations to diverse habitats.	**Critical Thinking**
11	**Busy Candy Shop**	**Statistical Tables**	Collect information and record data using tally charts to solve real-life problems. Students will analyze the results to express related information and make suggestions.	**Measurement and Data**
12	**Binary Magic**	**Understand Coding**	Explore number-grid relationships, which is the basic thinking of coding. This enhances students' analytical thinking and practical application skills.	**Reasoning**
13	**All Aboard to Lessville**	**Subtraction in 20**	Review the meaning of subtraction and subtraction within 10. Students will practice simple calculations within 20 using column subtraction.	**Number**
14	**Colorful Blocks**	**Tangram**	Enhance students' perception of shapes with shadow-matching activities and hands-on manipulation of the flat tangram. This will further cultivate spatial awareness and layout comprehension.	**Creativity**
15	**Half & Double**	**Mysterious Castle**	By observing the change in amount of different items, the children will learn to use a symbol to represent that change including plus, minus, double, or half. This enhances the children's number sense and ability in analogy.	**Number**

Think Academy

G1 Fall Syllabus Honors



	Topic	Knowledge Point	Content	Ability
1	Shape Jamboree	Patterns in Shapes	Find the pattern in a sequence of shapes that involves multiple changes. Enhance students' ability in observation and logical reasoning.	Reasoning
2	Peek-a-Boo Punches	Paper Folding	Student will learn to envision the outcome of folding a piece of paper, making cuts or hole punches, and then unfolding it. Hands-on activities will enhance their understanding of symmetry in paper folding and spatial awareness.	Creativity
3	Number Buddies	Addition and Subtraction Strategy	Learn the strategy of adding or subtracting numbers that can make a round number first. Students can solve long addition and subtraction quickly.	Number
4	Shape Tally	Count Plane Shapes	Count line segments, triangles and other shapes in a composed shape in order. Cultivate students' ability in classifying shapes and orderly counting.	Spatial Sense
5	No Hurry	Problems of Lining	Understand the difference between cardinal number and ordinal number to solve lining-up problems. Find the total number of people by drawing the line. Improve students' ability of solving word problems.	Number
6	Number Riddle	Patterns in Sequences	Explore the patterns in number sequences with constant difference. Combining number pattern with shapes, improve students' number sense by cultivating their step-by-step and sorting habbits.	Reasoning
7	Snip	Cut Shapes	Through hands-on activities such as cutting and combining, students can discover the relationships between different shapes. This cultivates their creativity and understanding of geometry.	Creativity
8	Addition Elevator	Column Addition	Learn column addition to solve additions of 2-digit numbers without and with regrouping. This approach helps students enhance their calculation accuracy, providing a strong basis for more advanced mathematical operations.	Number
9	Cube Tower	Counting Solid Shapes	Understand different views of solid shapes made by cubes. Student will learn how to count cubes in order and find invisible cubes. Helps students develop spatial visualization and logical reasoning skills.	Spatial Sense
10	Digit Whiz	Sudoku	Understand Sudoku methods, and be familiar with the relationships among rows, columns, and boxes in the grid. Learn 4 × 4 and 6 × 6 Sudoku. Expand into more complex problems and master the "exclusive" ways of solving Sudoku puzzles.	Reasoning
11	Time Keeper	Time Calculation	Develop skills in reading clocks to five minutes. Students will master the calculation of time and tackle real-life scenarios using time-related math.	Measurement and Data
12	Equal and Balanced	Equivalent Substitution	Find the relationship between the quantities of different objects. Understand equal relationships and learn how to exchange different objects on a balance scale.	Reasoning
13	Subtraction Slide	Column Subtraction	Learn and use column subtraction of two-digit numbers without and with regrouping. Use column subtraction to solve word problems involving larg numbers.	Number
14	Shopping Expert	Money in Math	Learn about money and its values. Practice buying things without getting change. Understand common discounts and deals like "buy two get one free" and sale prices.	Measurement and Data
15	How Likely	Probability	Understand events that may or may not occur within the same game. Students will explore the basic concept of probability, investigate factors that influence potential outcomes.	Expression

Think Academy

G1 Fall Syllabus Challenge



	Topic	Knowledge Point	Content	Ability
1	**Shape Jamboree**	**Patterns in Shapes**	Find the pattern in a sequence of shapes that involves multiple changes. Enhance students' ability in observation and logical reasoning.	**Reasoning**
2	**Peek-a-Boo Punches**	**Paper Folding**	Student will learn to envision the outcome of folding a piece of paper, making cuts or hole punches, and then unfolding it. Hands-on activities will enhance their understanding of symmetry in paper folding and spatial awareness.	**Creativity**
3	**Number Buddies**	**Addition and Subtraction Strategy**	Learn the strategy of adding or subtracting numbers that can make a round number first. Students can solve long addition and subtraction quickly.	**Number**
4	**Shape Tally**	**Count Plane Shapes**	Count line segments, triangles and other shapes in a composed shape in order. Cultivate students' ability in classifying shapes and orderly counting.	**Spatial Sense**
5	**No Hurry**	**Problems of Lining**	Understand the difference between cardinal number and ordinal number to solve lining-up problems. Find the total number of people by drawing the line. Improve students' ability of solving word problems.	**Number**
6	**Number Riddle**	**Patterns in Sequences**	Explore the patterns in number sequences with constant difference. Combining number pattern with shapes, improve students' number sense by cultivating their step-by-step and sorting habbits.	**Reasoning**
7	**Snip**	**Cut Shapes**	Through hands-on activities such as cutting and combining, students can discover the relationships between different shapes. This cultivates their creativity and understanding of geometry.	**Creativity**
8	**Addition Elevator**	**Column Addition**	Learn column addition to solve additions of 2-digit numbers without and with regrouping. This approach helps students enhance their calculation accuracy, providing a strong basis for more advanced mathematical operations.	**Number**
9	**Cube Tower**	**Counting Solid Shapes**	Understand different views of solid shapes made by cubes. Student will learn how to count cubes in order and find invisible cubes. Helps students develop spatial visualization and logical reasoning skills.	**Spatial Sense**
10	**Digit Whiz**	**Sudoku**	Understand Sudoku methods, and be familiar with the relationships among rows, columns, and boxes in the grid. Learn 4 × 4 and 6 × 6 Sudoku. Expand into more complex problems and master the "exclusive" ways of solving Sudoku puzzles.	**Reasoning**
11	**Time Keeper**	**Time Calculation**	Develop skills in reading clocks to five minutes. Students will master the calculation of time and tackle real-life scenarios using time-related math.	**Measurement and Data**
12	**Equal and Balanced**	**Equivalent Substitution**	Find the relationship between the quantities of different objects. Understand equal relationships and learn how to exchange different objects on a balance scale.	**Reasoning**
13	**Subtraction Slide**	**Column Subtraction**	Learn and use column subtraction of two-digit numbers without and with regrouping. Use column subtraction to solve word problems involving larg numbers.	**Number**
14	**Shopping Expert**	**Money in Math**	Learn about money and its values. Practice buying things without getting change. Understand common discounts and deals like "buy two get one free" and sale prices.	**Measurement and Data**
15	**How Likely**	**Probability**	Understand events that may or may not occur within the same game. Students will explore the basic concept of probability, investigate factors that influence potential outcomes.	**Expression**

Think Academy

G2 Fall Syllabus Honors



	Topic	Knowledge Point	Content	Ability
1	Trace Around	Find the Perimeter	Explore the concept of perimeter. Students will be able to calculate the perimeter of squares and rectangles, and they will understand the relationship between the perimeter and the sides of these shapes.	Spatial Sense
2	Cube Painter	Color Cubes	Learn to find the numbers of colored and uncolored faces of a composed solid shape. Students can find the number of cubes with a certain number of faces colored based on their positions in the composed solid shape.	Spatial Sense
3	Taking Inventory	Figure Counting using Multiplication	Apply various methods to count simple shapes. Grasp the classification technique for counting complex figures. Learn to identify the 'unit shape' for figure counting through multiplication. Foster children's ability to think in an organized manner.	Number
4	Figure Decipher	Operation Without Numbers	Learn to solve equations with pictures. Students will apply the properties of equality and use substitution to find the value of each picture.	Reasoning
5	Division Dynamos	Understand Division	Incorporate the use of a multiplication table during calculations to deepen students' understanding of division. They will master calculations that require mixed operations and further cultivate their number sense.	Number
6	Slice 'n' Dice	Understand Fractions	Learn the basics of fractions including the meaning of the numerator and denominator of a fraction. Students will be able to compare fractions with the same numerator or denominator, and add or subtract like fractions.	Number
7	Lining Up!	Complex Lining-Up Problems	Solve problems involving two main characters in the line by drawing. Learn to find the total number of people in the line or a part of the line with proper graphs, and further improve the ability to solve real-life problems.	Number
8	Multiplication Ladder	Long Multiplication	Use long multiplication to calculate a two-digit or a three-digit number multiplying a one-digit number. Students can use long multiplication in solving problems with larger numbers.	Number
9	Little Explorer	Map	Learn the essential components of a map, then practice how to effectively use a map for navigation. Students can apply these skills in planning a travel route, which enhances their understanding of geography and improves their ability to navigate and plan trips.	Measurement and Data
10	Line Segment to Help	Sum-difference Problems	In a given word problem, identify the correct numbers needed for a sum-difference problem. Students will use line segments to help them visualize each problem. This will deepen their understanding of division. Students will also solve problems integrating numbers and shapes.	Number (word problem)
11	Sort it Out!	Count in Order	Enumerate all possible combinations of numbers, arranged from least to greatest, using the provided digits. This task offers students the opportunity to refine their combination skills effectively.	Number
12	Happy-go-Unlucky	Worse-Case Scenario	Explore the factors critical to planning in worst-case scenarios and learn how many attempts might be necessary to ensure task completion. Enhance students' strategic thinking and resilience in facing challenging situations.	Critical Thinking
13	Branching Out	Tree Diagram	Understand tree diagrams. Learn how to draw tree diagrams and use them to solve problems involving enumeration.	Reasoning
14	Unity Quest	Find the Unit	Understand the importance of the unit in different situations. Students can apply division to solve related real-life problems and acquire a better understanding of the relationships among quotient, divisor, and dividend.	Number
15	Detective's Notes	Comparative and Conditional Reasoning	Learn to navigate complex sequential reasoning, then delve into conditional reasoning using tables. Finally, integrate these skills through interactive table-based games, enhancing students' logical thinking and problem-solving abilities in engaging and practical contexts.	Reasoning

Think Academy

G2 Fall Syllabus Challenge



	Topic	Knowledge Point	Content	Ability
1	**Trace Around**	**Find the Perimeter**	Explore the concept of perimeter. Students will be able to calculate the perimeter of squares and rectangles, and they will understand the relationship between the perimeter and the sides of these shapes.	**Spatial Sense**
2	**Cube Painter**	**Color Cubes**	Learn to find the numbers of colored and uncolored faces of a composed solid shape. Students can find the number of cubes with a certain number of faces colored based on their positions in the composed solid shape.	**Spatial Sense**
3	**Special Role in Division**	**Division With Remainders**	Build on previous learning of division, students will continue learn division with remainders. Students will be able to solve problems involving remainders.	**Number**
4	**Figure Decipher**	**Operation Without Numbers**	Learn to solve equations with pictures. Students will apply the properties of equality and use substitution to find the value of each picture.	**Reasoning**
5	**Stat Stars**	**Find the Average**	Understand the meaning of average and weighted average. Solve complex problems using the idea of balancing.	**Number**
6	**Slice 'n' Dice**	**Understand Fractions**	Learn the basics of fractions including the meaning of the numerator and denominator of a fraction. Students will be able to compare fractions with the same numerator or denominator, and add or subtract like fractions.	**Number**
7	**Lining Up!**	**Complex Lining-Up Problems**	Solve problems involving two main characters in the line by drawing. Learn to find the total number of people in the line or a part of the line with proper graphs, and further improve the ability to solve real-life problems.	**Number**
8	**Multiplication Ladder**	**Long Multiplication**	Use long multiplication to calculate a two-digit or a three-digit number multiplying a one-digit number. Students can use long multiplication in solving problems with larger numbers.	**Number**
9	**Little Explorer**	**Map**	Learn the essential components of a map, then practice how to effectively use a map for navigation. Students can apply these skills in planning a travel route, which enhances their understanding of geography and improves their ability to navigate and plan trips.	**Measurement and Data**
10	**Line Segment to Help**	**Sum-difference Problems**	In a given word problem, identify the correct numbers needed for a sum-difference problem. Students will use line segments to help them visualize each problem. This will deepen their understanding of division. Students will also solve problems integrating numbers and shapes.	**Number (word problem)**
11	**Sort it Out!**	**Count in Order**	Enumerate all possible combinations of numbers, arranged from least to greatest, using the provided digits. This task offers students the opportunity to refine their combination skills effectively.	**Number**
12	**Happy-go-Unlucky**	**Worse-Case Scenario**	Explore the factors critical to planning in worst-case scenarios and learn how many attempts might be necessary to ensure task completion. Enhance students' strategic thinking and resilience in facing challenging situations.	**Critical Thinking**
13	**Branching Out**	**Tree Diagram**	Understand tree diagrams. Learn how to draw tree diagrams and use them to solve problems involving enumeration.	**Reasoning**
14	**Unity Quest**	**Find the Unit**	Understand the importance of the unit in different situations. Students can apply division to solve related real-life problems and acquire a better understanding of the relationships among quotient, divisor, and dividend.	**Number**
15	**Detective's Notes**	**Comparative and Conditional Reasoning**	Learn to navigate complex sequential reasoning, then delve into conditional reasoning using tables. Finally, integrate these skills through interactive table-based games, enhancing students' logical thinking and problem-solving abilities in engaging and practical contexts.	**Reasoning**

Think Academy

G2 Fall Syllabus ACE



	Topic	Content	Ability
1	**Find the Perimeter**	Explore the concept of perimeter. Students will be able to calculate the perimeter of squares and rectangles, and they will understand the relationship between the perimeter and the sides of these shapes.	**Spatial Sense**
2	**Division With Remainders**	Build on previous learning of division, students will continue learn division with remainders. Students will be able to solve problems involving remainders.	**Number**
3	**Color Cubes**	Learn to find the numbers of colored and uncolored faces of a composed solid shape. Students can find the number of cubes with a certain number of faces colored based on their positions in the composed solid shape.	**Spatial Sense**
4	**Operation Without Numbers**	Learn to solve equations with pictures. Students will apply the properties of equality and use substitution to find the value of each picture.	**Reasoning**
5	**Divide Shapes**	Learn to divide shapes into specific parts, enhancing their spatial reasoning and geometric understanding. Students will be able to solve complex problems involving shape division and reforming.	**Spatial Sense**
6	**Complex Lining-Up Problems**	Solve problems involving two main characters in the line by drawing. Learn to find the total number of people in the line or a part of the line with proper graphs, and further improve the ability to solve real-life problems.	**Number (Word Problem)**
7	**Long Multiplication**	Use long multiplication to calculate a two-digit or a three-digit number multiplying a one-digit number. Students can use long multiplication in solving problems with larger numbers.	**Number**
8	**Parentheses in Addition and Subtraction**	Know the properties of addition and utilize properties in pairing numbers and tricks of making tens. Master the rules of adding and removing parentheses in addition and subtraction.	**Number**
9	**Find the Unit**	Understand the importance of the unit in different situations. Students can apply division to solve related real-life problems and acquire a better understanding of the relationships among quotient, divisor, and dividend.	**Number (Word Problem)**
10	**Comparative and Conditional Reasoning**	Learn to navigate complex sequential reasoning, then delve into conditional reasoning using tables. Finally, integrate these skills through interactive table-based games, enhancing students' logical thinking and problem-solving abilities in engaging and practical contexts.	**Reasoning**
11	**Sum-Multiples Problems**	Use line segments to visualize the problems with sums and multiples. Enhance students' ability of combining numerical and geometrical concepts.	**Number (Word Problem)**
12	**Number Pattern**	Learn to carefully observe and find patterns in number sequences, building a collection of common patterns to strengthen students' understanding of numbers. This approach helps student become more familiar with sequences and improves their overall sense of numbers.	**Reasoning**
13	**Difference-Multiple Problems**	Use line segments to visualize problems with differences and multiples. Cultivate the ability to understand how to read and solve problems with differences and multiples, and the ability to turn complex problems into simple graphs.	**Number (Word Problem)**
14	**Understanding Fractions**	Learn the basics of fractions including the meaning of the numerator and denominator of a fraction. Students will be able to compare fractions with the same numerator or denominator, and add or subtract like fractions.	**Number**
15	**Understanding Area**	Explore the concept of area. Students will be able to use formulas to calculate the area of rectangles and squares. They learn how to work backward from a known area to find missing dimensions.	**Spatial Sense**

Think Academy

G3 Fall Syllabus Honors



	Topic	Content	Common Core Standard
1	**Lines and Angles**	Knowing Different Types of Lines Knowing Different Types of Angles Recognizing Lines and Angles in Real-Life Objects	**CC4.G**
2	**Classify Triangles**	Classifying Triangles by Angles Classifying Triangles by Sides Comprehensive Determination of Triangles	**CC4.G**
3	**Equivalent Fractions**	Using Models to Understand Equivalent Fractions Finding Equivalent Fractions Applying Equivalent Fractions in Word Problems	**CC4.NF**
4	**Calculation of Fractions**	Addition with the Same Denominator Subtraction with the Same Denominator Addition and Subtraction with the Same Denominator in Word Problems	**CC4.NF**
5	**Distributive Law of Multiplication**	Using models to Understand Distributive Law of Multiplication Extracting Common Factors Applying Distributive Law in Word Problems	**CC4.OA**
6	**Calculation of Time**	Calculating Time Addition Elapsed Time Calculation Applying Time Calculations in Real-Life Situations	**CC4.MD**
7	**Parallel Lines and Perpendicular Lines**	Understanding the Parallel and Perpendicular Identifying Parallel and Perpendicular Lines Counting the Parallel and Perpendicular Lines in a Figure	**CC4.G**
8	**Number Puzzles**	Multiplying a Two-Digit Number by a One-Digit Number Number Puzzles with Multiplication	**CC4.NBT**
9	**Estimation of Numbers**	Rounding Numbers Estimating Addition and Subtraction Applying Estimation in Real-Life Situations	**CC4.NBT**
10	**Know Quadrilaterals**	Knowing the Properties of Special Quadrilaterals (parallelogram, rhombus, trapezoid, square, rectangle) Identifying Special Quadrilaterals in Real-Life	**CC4.G**
11	**Basic Division**	Division of Whole Numbers Applying Division in Word Problems	**CC4.NBT**
12	**Advanced Division**	Dividing a Multi-Digit Number by a One-Digit Number Applying Division in Word Problems	**CC4.NBT**
13	**Metric Units**	Conversion of Metric Weight Units Conversion of Metric Length Units Applying Units Conversion in Real-Life	**CC4.MD**
14	**Time and Time Zones**	Reading and Writing Time Advanced Time Addition and Subtraction Calculating Time Addition and Subtraction in Time Zone Problems	**CC4.MD**
15	**Find Patterns**	Identifying Number Patterns Identifying Shape and Geometric Patterns Applying Patterns in Word Problems	**CC4.OA**

Think Academy

G3 Fall Syllabus Challenge



	Topic	Content	Module
1	**Word Problems on Estimated Numbers**	Learn the rules, definitions, and methods of large number estimation, as well as how to find the original numbers based on the given estimation results. Study the estimation and application of large number addition and subtraction.	**Operations & Algebraic Thinking**
2	**Operation Strategies in Multiplication of Whole Numbers**	Master simplifying multiplication with numbers ending in zeros. Discover good friend pairs to make calculations easier. Develop estimation skills in multiplication.	**Operations & Algebraic Thinking**
3	**Polygons**	Build a solid foundation in analyzing geometric shapes to accurately distinguish between different polygons. Calculate the perimeter of polygons. Know the properties of quadrilaterals and regular polygons.	**Geometry**
4	**Strategies with Distributive Property of Multiplication**	Apply the distributive property of whole numbers and extract the common factor in multiplication.	**Operations & Algebraic Thinking**
5	**Parallelograms**	Recognize parallelograms, and understand their geometric features. Learn to find the height of a parallelogram. Explore the formula for the area of parallelograms, and apply it to solve related problems.	**Geometry**
6	**Word Problems on Multiplication and Division**	Mastered solving single-step/multi-step multiplication/division word problems (including division with remainders) and applied to the sum-and-multiple problems.	**Operations & Algebraic Thinking**
7	**Multiplication of Decimals**	Learn basic decimal multiplication, and apply it to solve real-world problems.	**Number & Operations in Base Ten**
8	**Trapezoids**	Recognize trapezoids, and understand its graphic features. Learn to find the height of a trapezoid. Experiment with the area formula of trapezoids, and apply it to solve related problems.	**Geometry**
9	**Division of Decimals**	Learn basic decimal division, and apply it to solve real-world problems.	**Number & Operations - Fractions**
10	**Metric Units in Applications**	Recognize units of length, weight, and area, and match them accurately to daily life contexts. Develop an intuitive understanding of physical quantities. Master unit conversions and their practical applications.	**Measurement & Data**
11	**Improper Fractions and Mixed Numbers**	Understand the definition of improper fractions and mixed numbers. Find the relationship between improper fractions and mixed numbers.	**Number & Operations - Fractions**
12	**Divisibility Rules**	Learn the properties of divisibility rules. Understand why numbers can be divided without any remainder and cultivate computation skills.	**Operations & Algebraic Thinking**
13	**Factors and Multiples**	Understand factors and multiples. Find factors and multiples in the range of 1-100. Solve real-world problems using factors and multiples.	**Operations & Algebraic Thinking**
14	**Word Problems of Time**	Learn to convert between different time units (hours, minutes, seconds). Master the conversion between 12-hour and 24-hour time formats. Calculate time across AM and PM periods.	**Measurement & Data**
15	**Basic Distance, Speed, and Time**	Understand the concepts of distance, speed and time, and the relationship among them. Discuss the calculation of average speed. Apply distance, speed and time to solve word problems.	**Measurement & Data**

Think Academy

G3 Fall Syllabus ACE



	Topic	Content	Module
1	**Complicated Age Problems**	Solve basic age problems with the difference of ages and sum of ages. Solve the age problems by finding the relationship between ages.	**Word Problems**
2	**Operation Strategy in Multiplication of Whole Numbers**	Apply distributive law of whole numbers and extract the common factor in multiplication.	**Numbers and Operations**
3	**Chicken & Rabbit Problems**	Discuss generalized chicken-rabbit problems by using hypothesis. Learn how to solve the problem which includes the deducting marks.	**Word Problems**
4	**Parallelograms**	Recognize parallelograms, and understand its graphic features. Learn to find the height of a parallelogram. Experiment with the area formula of parallelograms, and apply it to solve related problems.	**Geometry**
5	**Multiplication of Decimals**	Learn basic decimal multiplication, and apply it to solve real-world problems.	**Numbers and Operations**
6	**Advanced Sums and Multiples**	Use line segments to visualize the problems with sums and multiples. Cultivate the ability to understand how to read and solve problems with sums and multiples, and the ability to turn complex problems into simple graphs.	**Word Problems**
7	**Trapezoids**	Recognize trapezoids, and understand its graphic features. Learn to find the height of a trapezoid. Experiment with the area formula of trapezoids, and apply it to solve related problems.	**Geometry**
8	**Division of Decimals**	Learn basic decimal division, and apply it to solve real-world problems.	**Numbers and Operations**
9	**Rule of Sum and Rule of Product**	Understand the principle of addition and multiplication, and their essential difference. Apply the principle of addition and multiplication to solve step-by-step problems.	**Counting, Probability, and Statistics**
10	**Advanced Differences and Multiples**	Use line segments to visualize problems with differences and multiples. Cultivate the ability to understand how to read and solve problems with differences and multiples, and the ability to turn complex problems into simple graphs.	**Word Problems**
11	**Improper Fractions and Mixed Numbers**	Understand the definition of improper fractions and mixed numbers. Find the relationship between improper fractions and mixed numbers.	**Numbers and Operations**
12	**Divisibility Rules**	Learn the properties of divisibility rules. Understand why numbers can be divided without any remainder and cultivate computation skills.	**Number Theory**
13	**Basic Distance, Speed, and Time**	Understand the concepts of distance, speed and time, and the relationship among them. Discuss the calculation of average speed. Apply distance, speed and time to solve word problems.	**Word Problems**
14	**Basic Addition and Subtraction of Fractions**	Calculate proper fractions, improper fractions, and mixed numbers with the same denominator.	**Numbers and Operations**
15	**Calendar and Period**	Learn to read calendars and extract information. Know the interval problems in weeks, years, and other calendar units.	**Word Problems**

Think Academy

G4 Fall Syllabus Core+



	Topic	Detail	Common Core
1	**Play Around with the Fractions**	Applying Fractions in Multi-ways Word Problems on Fractions	**CC4.NF**
2	**Equivalent Fractions**	Using Models to Understand Equivalent Fractions Finding Equivalent Fractions Applying Equivalent Fractions in Word Problems	**CC4.NF**
3	**Calculation of Fractions**	Addition and Subtraction with the Same Denominator Basic Multiplication of Fractions Word Problems on Fractions	**CC4.NF**
4	**Advanced Multiplication of Whole Numbers**	Multiplication of Whole Numbers with Carryings Conversion of Customary Units	**CC4.NBT**
5	**Advanced Division of Whole Numbers**	Division of Whole Numbers with Remainders Interval Word Problems	**CC4.NBT**
6	**Greatest Common Factors and Least Common Multiples**	Finding the Greatest Common Factor and Least Common Multiple Word Problems with Common Multiples Word Problems with Common Factors	**CC4.OA**
7	**Knowing Angles**	Understanding Angles Angles and Fractional Parts of Circle Counting Angles	**CC4.G**
8	**Play Around with Decimals**	Understanding Decimals Word Problems with Reading and Writing Decimals	**CC4.NF**
9	**Complex Division of Whole Numbers**	Advanced Division of Whole Numbers Sum and Multiple Problems	**CC4.NBT**
10	**Two-digit Numbers Multiplication**	Multiply 2-digit Numbers Word Problems with Multiplication by 2-digit Numbers	**CC4.NBT**
11	**Comparison of Fraction**	Comparing Fractions Word Problems with Fraction Comparison	**CC4.NBT**
12	**Comparison of Decimal**	Comparing Decimals Word Problems with Decimal Comparison	**CC4.NF**
13	**Calculation of Angles**	Addition and Subtraction of Angles Angle Calculation in Shapes Calculating Angles in Real-Life Situations	**CC4.NF**
14	**Knowing Triangles**	Characteristics and Classification of Triangles The Sum of the Angles of Triangle	**CC4.G**
15	**Plane Shapes and Solid Figures**	Plane Shapes and Solid Figures Paper Folding	**CC4.G**

Think Academy

G4 Fall Syllabus Honors



	Topic	Content	Common Core Standard
1	**Advanced Prime and Composite Numbers**	Knowing Prime and Composite Numbers within 100 Properties of Prime and Composite Numbers within 100 Applying Prime and Composite Numbers in Real-World Context	**CC4.OA**
2	**Multi-digit Number Multiplication**	Using Friendly Numbers to Multiply The Associative Property of Multiplication The Distributive Property of Multiplication	**CC5.NBT**
3	**Convert Customary Units**	Knowing Customary Units of Length and Weight Matching Appropriate Customary Units to Everyday Objects Converting and Comparing Customary Units	**CC5.MD**
4	**Multi-digit Number Division**	Dividing by Two-Digit Numbers Word Problems on Economics Operation Strategies in Division	**CC5.NBT**
5	**Basic Coordinate Plane**	Describing the Coordinate Plane Graphing Data Using Ordered Pairs Word Problems on Coordinate Plane	**CC5.G**
6	**Patterns and Relationships**	Numerical Patterns Finding Patterns Ploting Relationship on Graphs	**CC5.OA**
7	**Magic of Rotation**	Rotation Properties and Directions Rotating Line Segment by 90° and 180° Rotating Shapes by 90° and 180°	**CC5.G**
8	**Improper Fractions and Mixed Numbers**	Knowing Improper Fractions and Mixed Numbers Relationship Between Improper Fractions and Mixed Numbers Convert Between Mixed Numbers and Improper Fractions	**CC4.NF**
9	**Addition and Subtraction Strategies of Fractions**	Finding Common Denominator and Simplifying Fractions Addition on Fractions with Unlike Denominators Subtraction on Fractions with Unlike Denominators	**CC5.NF**
10	**Polygons**	Knowing Polygons Knowing Regular Polygons Classifying Quadrilaterals	**CC5.G**
11	**Addition of Mixed Numbers**	Addition of Mixed Numbers with Like Denominators Application of Mixed Numbers Addition	**CC4.NF**
12	**Subtraction of Mixed Numbers**	Subtraction of Mixed Numbers with Like Denominators Subtraction of Mixed Numbers with Like Denominators with Renaming Application of Mixed Numbers Subtraction	**CC4.NF**
13	**Properties of Triangles**	Knowing the Properties of Triangles and Special Triangles Applying the Angle Sum Property of Triangles Classifying Triangles by Sides	**CC5.G**
14	**Addition and Subtraction Strategies of Decimals**	Adding Decimals Subtracting Decimals Word Problems on Decimals	**CC5.NF**
15	**Basic Algebraic Expressions**	Using Letters to Represent Numbers Writing Algebraic Expressions Solving Simple Equations	**CC5.OA**

Think Academy

G4 Fall Syllabus

Intro to Challenge/Challenge



	Topic	Content	Module
1	**Calculation on Fractions, Decimals, and Percentages**	Understand the relationship between percentages and fractions, and learn to convert them. Apply the knowledge of conversion to the mixed calculation of fractions, decimals, and percentages.	**Numbers and Operations**
2	**Complicated Inclusion and Exclusion**	Understand overlapping issues and count without repeating or missing numbers. Conclude and induct the patterns when more than two attributes are discussed.	**Combinatorics**
3	**Grids and Shifts**	Understand grids, and learn the calculation methods of various shapes on square grid points and triangle grid points.	**Geometry**
4	**Basic Word Problems on Fractions**	Understand the meaning of "the whole" and solve complex word problems on fractions through the corresponding relationship between quantity and rate.	**Word Problems**
5	**Extremum**	Discuss extremization problems that appear in different modules such as number theory, geometry, and combinatorics.	**Combinatorics**
6	**Half-Area Model**	Split rectangles, parallelograms, trapezoids, and general irregular quadrilaterals into two equal area parts. Extend the idea in complicated geometry problems with half area models.	**Geometry**
7	**Advanced Word Problems on Fractions**	Find "the whole" and solve complex word problems on fractions through the corresponding relationship between quantity and rate.	**Word Problems**
8	**Advanced Probability**	Review the definition of outcome and the calculation of probability. Introduce the concept of classical probability. Calculate the probability of events using the rule of sum and rule of product.	**Counting, Probability, and Statistics**
9	**Ratio and Proportion**	Understand the meanings of ratios and proportions, and difference between them. Learn the relationship between ratios, fractions, and divisions. Learn to simplify ratios, combine ratios, and compute ratio values. Learn to solve proportion equations according to the basic properties of ratios and proportions.	**Numbers and Operations**
10	**Solving Word Problems with Equations**	Continue solving more complicated word problems by forming equations (sum/difference/multiplication, etc.).	**Word Problems**
11	**Theorem of the Number of Factors of a Number**	Review the concept of prime factorization. Introduce the theorem of the number of factors of a number and use it to solve classic number theory problems.	**Number Theory**
12	**Currency Problems**	Review the conversion between different currency units. Solve money-related problems such as price calculations and making changes in shopping scenarios. Explore the ways to make up a given total amount of money and related extremum problems.	**Word Problems**
13	**Word Problems on Proportions and Invariant**	Understand the meaning of invariants and solve complex word problems on proportions by finding the relationship between the invariants and the proportions.	**Word Problems**
14	**Advanced Equations**	Introduce the way to combine similar terms and change signs when numbers are carried to the other side of the equation. Solve equations with brackets. Provide a pathway to advanced algebra and functions.	**Algebra and Sequence**
15	**Advanced Logical Reasoning**	Solve advanced logical reasoning word problems using two common methods, inference of true and false statements and implication inference.	**Combinatorics**

Think Academy

G5 Fall Syllabus Core+



	Topic	Detail	Common Core
1	**Multi-digit Number Multiplication**	Using Friendly Numbers to Multiply The Associative Property of Multiplication The Distributive Property of Multiplication	**CC5.NBT**
2	**Advanced Addition and Subtraction of Fractions**	Addition and Subtraction of Fractions with Different Denominators Applying Fractions with Different Denominators	**CC5.NF**
3	**Advanced Addition and Subtraction of Decimals**	Addition and Subtraction of Decimals Word Problems on Decimals	**CC5.NBT**
4	**Basic Coordinate Plane**	Describing the Coordinate Plane Graphing Data Using Ordered Pairs Word Problems on Coordinate Plane	**CC5.G**
5	**Improper Fractions and Mixed Numbers**	Knowing Improper Fractions and Mixed Numbers Comparing Improper Fractions and Mixed Numbers	**CC5.NF**
6	**Complex Addition and Subtraction of Fractions**	Addition and Subtraction of Fractions with Different Denominators Applying Fractions with Different Denominators	**CC5.NF**
7	**Advanced Multiplication of Mixed Numbers and Fractions**	Multiplication of Mixed Numbers and Fractions Applying the Multiplication of Fractions to Solve Problems	**CC5.NF**
8	**Complex Division of Fractions**	Knowing Complex Division of Fractions Applying Complex Division of Fractions to Solve Problems	**CC5.NF**
9	**Properties of Triangles**	Knowing the Properties of Triangles and Special Triangles Applying the Interior Angles	**CC5.G**
10	**Convert Customary Units**	Knowing Customary Units of Length and Weight Matching Appropriate Customary Units to Everyday Objects Converting and Comparing Customary Units	**CC5.MD**
11	**Advanced Multiplication of Decimals**	Advanced Multiplication of Decimals Interval Word Problems	**CC5.NBT**
12	**Complex Multiplication of Decimals**	Complex Multiplication of Decimals Knowing the Change of Average	**CC5.NBT**
13	**Advanced Division of Decimals**	Advanced Decimals Divided by Whole Number Distance, Speed and Time	**CC5.NBT**
14	**Complex Division of Decimals**	Complex Division of Decimals Calculate with a Workflow	**CC5.NBT**
15	**Patterns and Relationships**	Numerical Patterns Finding Patterns Ploting Relationship on Graphs	**CC5.OA**

Think Academy

G5 Fall Syllabus Honors



	Topic	Content	Common Core Standard
1	**Absolute Values**	Comparing Negative Decimals and Fractions Finding Absolute Values Application of Comparing and Absolute Values	**CC6.NS**
2	**Adding Negative Integers**	Adding Integers With the Same Sign Adding Integers With Different Signs Deposit and Withdrawal Problems	**CC7.NS**
3	**Subtracting Negative Integers**	Subtracting a Positive Integer Subtracting a Negative Integer Solving Real-World Problems and Reasoning	**CC7.NS**
4	**Coordinate Plane**	Understanding the Coordinate Plane Translations on the Coordinate Plane Symmetrical Points on the Coordinate Plane	**CC6.NS**
5	**Mixed Operations of Integers**	The Order of Operations Involving Exponents The Order of Operations Involving Brackets Word Problems on Integers	**CC6.NS**
6	**Mixed Operations of Fractions**	Integrated Calculation of Fractions Word Problems on Fractions Understanding the Relationship Between Whole and Part	**CC6.NS**
7	**Mean, Median, and Mode**	Understanding Mean, Median, and Mode Word Problems on Mean Choosing the Appropriate Statistical Measurement	**CC6.SP**
8	**Speed, Distance, and Time**	Understanding Speed, Distance, and Time Word Problems on Different Speeds Word Problems on Average Speed	**CC6.RP**
9	**Probability**	Understanding the Concept of Probability Calculating Experimental Probability Application of Experimental Probability	**CC7.SP**
10	**Algebraic Expressions**	Modeling and Writing Algebraic Expressions Advanced Combining Like Terms Application of Writing Algebraic Expressions	**CC6.EE**
11	**Integer Equations**	Advanced Integer Equations Solving Equations with Strategies Solving Word Problems using Equations	**CC6.EE**
12	**Decimal and Fraction Equations**	Decimal Equations Fraction Equations Using Equations to Solve Problems Involving Whole and Part Relationships	**CC6.EE**
13	**Surface Area of Solid Figures**	Finding the Surface Area of Prisms Understanding the Surface Areas of Pyramids Word Problems Involving Surface Area	**CC6.G**
14	**Relationships Between Two Variables**	Understanding Independent and Dependent Variables Writing Equations from Tables Statistical Problems Using Variable Relationships	**CC6.EE**
15	**Range and IQR**	Understanding the Range Understanding the IQR Word Problems involving Range and IQR	**CC6.SP**

Think Academy

G5 Fall Syllabus

Intro to Challenge/Challenge



	Topic	Content	Module
1	**Exponents of Negative Numbers**	Work with exponents and rational numbers, and solve complex calculation problems.	**Numbers and Operations**
2	**Efficiency Word Problems**	Understand the three basic quantities in efficiency word problems and the relationship between those three quantities. Use basic formulas to solve inlet and outlet problems, as well as cooperation problems.	**Word Problems**
3	**Ratios, Rates, & Proportions**	Review the fundamentals of ratios, rates, and proportions. Learn to solve proportional equations. Understand quantitative relationships in real-world problems and apply proportional equations to solve them.	**Word Problems**
4	**Complicated Permutations and Combintations**	Review the basic knowledge of permutations and combinations, and learn about complex methods in problem solving, such as the binding method and the plate inserting method. Use these methods to solve more complicated problems.	**Counting, Probability, and Statistics**
5	**Understanding Benefits and Costs**	Understand basic profit formulas. Understand the concepts of profit, price, and cost, and be able to solve the real-world problems.	**Word Problems**
6	**Cylinders and Cones**	Review the basic knowledge of circles and sectors. Learn the basic knowledge of cylinders and cones. Master the formulas for volumes and surface areas of cylinders and cones.	**Geometry**
7	**Basic Square Roots and Irrational Numbers**	Understand the meaning of the root sign and understand its range. Be able to compare the values of different irrational numbers.	**Numbers and Operations**
8	**Advanced Square Roots and Irrational Numbers**	Master the simplification and operation of the square root of a number.	**Numbers and Operations**
9	**Pythagorean Theorem in Solid Figures**	Review the Pythagorean theorem. Learn Pythagorean numbers, chordal graphs, and the Pythagorean theorem of solid figures. Use the Pythagorean theorem to solve real-world problems.	**Geometry**
10	**Fun Word Problems**	Review common unit conversions. Learn multi-step word problems, word problems with equations, and rounding problems, while flexibly handling unit conversions in these problems. Improve skills in solving word problems.	**Word Problems**
11	**Digging Holes in Solid Figures**	Learn to find the volume of joined solid figures and be able to calculate the surface area and volume of solid figures with holes by slicing.	**Geometry**
12	**Coloring Solid Figures**	Learn to find the surface area of joined solid figures. Master the problem of coloring three-dimensional figures.	**Geometry**
13	**Understanding Mixture Concentration**	Understand the definition of concentration and master the calculation. Learn how to prepare a certain concentration of solution, and use concepts of concentration to solve real-world problems.	**Word Problems**
14	**Similarity Model**	Be familiar with the trapezoidal butterfly model, and master the pyramid model and the hourglass model. Learn the theory behind the models and know how to apply.	**Geometry**
15	**Chinese Remainder Theorem**	Use the Chinese Remainder Theorem with constant remainder and step-by-step calculations to solve congruence-related problems, and use the methods learned to solve complicated forms.	**Number Theory**

Syllabus for Pre-Algebra

2025 Fall Challenge

	Topics	Knowledge Points	Competition Topics
1	**Ratio and Rates**	1. Writing Ratios and Comparing Ratios 2. Continued Ratio 3. AMC 8: Word Problems	Ratios, Rates and Proportions
2	**Proportion**	1. Solve Proportion Equations 2. AMC 8: Application of Proportion Equations	Ratios, Rates and Proportions
3	**Percents**	1. Percents Conversion 2. Percent of Change 3. AMC 8: Word Problems of Percent Change	Ratios, Rates and Proportions
4	**Tackle AMC 8 AR: Travel Problems**	1. Distance, Time and Speed 2. Apply Equations to Travel Problems 3. S-t Graph	Travel Problems
5	**Tackle AMC 8 AR: Divisibility**	1. Place Value 2. Divisibility 3. Prime Number	Number Theory
6	**Tackle AMC 8 AR: Composite and Prime Factorization**	1. Parity 2. Prime Factorization 3. GCF & LCM	Number Theory
7	**Pythagorean Theorem**	1. Pythagorean Theorem 2. Converse of Pythagorean Theorem	Pythagorean Theorem
8	**Circles**	1. Definition of π 2. Basic Concepts of Circles 3. Circumference 4. Area of Circles and Annulus	Area of Circles

	Topics	Knowledge Points	Competition Topics
9	**Tackle AMC 8 AR: Perimeter and Area**	1. Quadralaterals 2. The Movement of Lines 3. Filling and Cutting Method 4. Overlapped Area Problems	Composite Figures
10	**Transformations 1**	1. Properties of Translation 2. Properties of Symmetry	Transformation of Shapes
11	**Transformations 2**	1. Properties of Rotation 2. Properties of Dilation	Transformation of Shapes
12	**Congruence and Similarity**	1. Congruent Figures 2. Similar Figures 3. Angle Similarity	Similarity Models
13	**Tackle AMC 8 AR: Similarity Models**	1. A-model 2. 8-model	Similarity Models
14	**Tackle AMC 8 AR: Addition and Multiplication Principles**	1. Addition Principle 2. Multiplication Principle 3. Factorials	Probability
15	**Tackle AMC 8 AR: Probability**	1. Definition of Probability 2. Finding Probability 3. Enumeration	Probability

Syllabus for Pre-Algebra

2025 Fall Honors

	Topics	Knowledge Points	Common Core
1	**Monomial and Polynomials**	1. Review of Algebraic Expressions 2. Monomial Definition 3. Polynomial Definition	EE 8. A
2	**Adding and Subtracting Polynomials**	1. Ascending and Descending Order 2. Adding Polynomials 3. Subtracting Polynomials	EE 8. A
3	**Multiplying Monomials and Polynomials**	1. FOIL 2. Multiplying Binomials	EE 8. A
4	**Ratio and Rates**	1. Writing Ratios and Comparing Ratios 2. Continued Ratio 3. Word Problems	7.RP.A.1
5	**Proportion**	1. Solving Proportion Equations 2. Application of Proportion Equations	7.RP.A.1
6	**Percents**	1. Percents Conversion 2. Percent of Change 3. Word Problems of Percent Change	7.EE.A.2 7.EE.B.3
7	**Pythagorean Theorem**	1. Pythagorean Theorem 2. Converse of Pythagorean Theorem	CCSS.7.G.A.2
8	**Quadrilaterals**	1. Parallelogram 2. Trapzoid 3. Rhombus 4. Composite Figures	CCSS.7.G.A.2
9	**Circles**	1. Definition of π 2. Basic Concepts of Circles 3. Circumference 4. Area of Circles and Annulus	CCSS.7.G.B.4
10	**Coordinate Plane**	1. Definition of Coordinate Plane 2. Quadrants 3. Polygons in Coordinate Plane 4. Properties of Translation	CCSS.8.G.A.3
11	**Transformations 1**	1. Properties of Symmetry 2. Properties of Rotation	CCSS.8.G.A.3
12	**Transformations 2**	1. Properties of Dilation 2. Representation of Dilation	CCSS.8.G.A.3
13	**Congruence and Similarity**	1. Congruent Figures 2. Similar Figures 3. Angle Similarity	CCSS.8.G.A.2 CCSS.8.G.A.4
14	**Similarity Triangles**	1. Similar Triangles 2. Similarity Models 3. Solving Similarity Problems in Geometry	CCSS.8.G.A.4
15	**Elementary Statistics**	1. Measure of Variation 2. Dot Plot & Box Plot 3. Histogram	CCSS.8.G.A.4

Syllabus for Algebra 1

2025 Fall Honors

	Topics	Knowledge Points	Common Core
1	**Absolute-Value Equations and Inequalities**	1. Simplify Absolute Values 2. Solving Absolute-Value Equations 3. Solving Absolute-Value Inequalities	HSA.REI.B.3
2	**Solving Systems of Linear Equations**	1. Solving Systems of Linear Equations by Substitution 2. Solving Systems of Linear Equations by Linear Combination 3. Word Problems	HSA.REI.C.5-6
3	**Inequalities and Systems of Linear Inequalities**	1. Solving Inequalities and Compound Inequalities 2. Solving Systems of Linear Inequalities 3. Word Problems	HSA.REI.B.3
4	**Basics of Linear Equations**	1. Concept of Linear Functions 2. Graphs of Linear Functions 3. Intersections with Two Axes 4. Intersections of the Graphs of Two Linear Functions	HSA.CED.A.2 HSF.BF.A.1
5	**Equations of Linear Functions**	1. Slope-Intercept Form 2. Point-Slope Form 3. Standard Form	HSF.BF.A.1 HSF.IF.B.4
6	**Transformations of Linear Equations**	1. Translation 2. Symmetry 3. Parallel Lines and Perpendicular Lines	HSF.BF.B.3
7	**Graphing Linear Inequalities in Two Variables**	1. Graphing Linear Inequalities in One Variable 2. Graphing Linear Inequalities in Two Variables 3. Graphing Systems of linear Inequalities	HSA.REI.D.12
8	**Mid-Term Review**	1. Mid-Term Review	
9	**Operations with Polynomials - Part 1**	1. Adding and Subtracting Polynomials 2. Removing Parentheses 3. Multiplying Polynomials 4. Special Products of Polynomials	HSA.APR.A.1
10	**Operations with Polynomials - Part 2**	1. Dividing Polynomials by a Monomial 2. Dividing Polynomials by a Binomial	HSA.APR.A.1
11	**Radicals: Operation and Simplification**	1. Simplifying Radicals 2. Operations with Radical Expressions 3. Rational Exponents	HSN.RN.A.1
12	**Factoring by GCF and Special Products**	1. Factoring by GCF 2. Factoring by Special Products	HSA.APR.B.2-3
13	**Factoring by Cross Method- Part 1**	1. Factoring Trinomials (a=1)	HSA.APR.B.2-3
14	**Factoring by Cross Method- Part 2**	1. Factoring Trinomials (a is not 1)	HSA.APR.B.2-3
15	**Final Review**	1. Final Review	

Syllabus for Algebra 1

2025 Fall Challenge

	Topic	Knowledge Point	Common Core
1	**Equations of Linear Functions**	1. Slope-Intercept Form 2. Point-Slope Form 3. Standard Form	HSF.BF.A.1 HSF.IF.B.4
2	**Solving Systems of Linear Equations**	1. Solving Systems of Linear Equations by Substitution 2. Solving Systems of Linear Equations by Linear Combination 3. Word Problems	HSA.REI.C.5-6
3	**Graphing Linear Inequalities in Two Variables**	1. Linear Inequalities Review 2. Graphing Linear Inequalities in Two Variables 3. The Area of the triangle in a System of Linear Inequalities	HSA.REI.D.12
4	**Operations with Polynomials - Part 1**	1. Adding and Subtracting Polynomials 2. Removing Parentheses 3. Multiplying Polynomials 4. Special Products of Polynomials	HSA.APR.A.1
5	**Operations with Polynomials - Part 2**	1. Dividing Polynomials by a Monomial 2. Dividing Polynomials by a Binomial	HSA.APR.A.1
6	**Factoring by GCF and Special Products**	1. Factoring by GCF 2. Factoring by Special Products 3. Factoring Complicated Polynomials	HSA.APR.B.2-3
7	**Factoring by Cross Method- Part 1**	1. Factoring Trinomials (a=1)	HSA.APR.B.2-3
8	**Factoring by Cross Method- Part 2**	1. Factoring Trinomials (a is not 1)	HSA.APR.B.2-3

	Topics	Knowledge Points	Common Core
9	**Quadratic Equations I**	1. Solving Quadratic Equations by Finding Square Roots 2. Solving Quadratic Equations by Graphing 3. Solving Quadratic Equations in Factored Form	HSA.CED.A.1 HSA.REI.B.4
10	**Quadratic Equations II**	1. Completing the Square 2. Solving Quadratic Equations by the Quadratic Formula 3. Using the Discriminant 4. Sums and Products of Roots of Quadratic Equations	HSA.REI.B.4
11	**Rational Expressions I**	1. Simplifying Rational Expressions 2. Multiplying and Dividing Rational Expressions	HSA.APR.A.1 HSA.APR.D.7
12	**Rational Expressions II**	1. Adding and Subtracting with Like Denominators 2. Adding and Subtracting with Unlike Denominators	HSA.APR.A.1 HSA.APR.D.7
13	**Proportions and Rational Equations**	1. Cross Multiply 2. Multiply by the LCD 3. Factor First, then Multiply by the LCD 4. Word Problem	HSA.SSE.A.1 HSA.SSE.B.3 HSA.REI.B.3
14	**Inverse Variation**	1. Equations of Inverse Variation 2. Graph of Inverse Variation 3. Properties of Inverse Variation 4. Word Problems	HSA.CED.A.2
15	**Operations with Radicals and Radical Equations**	1. Operations with Radicals Expressions 2. Graph Functions Involving Square Roots 3. Solve Radical Equations	HSA.SSE.B.3 HSA.REI.B.3

Syllabus for Geometry

2025 Fall **Honors**

	Topics	Knowledge Points	Common Core
1	**Angles in Polygons**	1. Angles in Triangles 2. Angles in Polygons	HSG.CO.C.10
2	**Inequalities in Triangles**	1. Inequalities in Triangles	HSG.CO.C.10
3	**Parallelograms**	1. Properties of Parallelogram 2. Ways to Prove that Quadrilaterals are Parallelograms	HSG.CO.C.11
4	**Rectangles**	1. Midsegment of a Triangle 2. Properties of Rectangle 3. Ways to Prove that Quadrilaterals are Rectangles	HSG.CO.C.11
5	**Rhombi and Squares**	1. Properties of Rhombus 2. Ways to Prove that Quadrilaterals are Rhombi 3. Properties of Squares	HSG.CO.C.11
6	**Trapezoids**	1. Properties of Trapezoid 2. Midsegment of Trapezoid	HSG.CO.C.11
7	**Ratio and Proportions**	1. Ratio and Proportion 2. Properties of Proportions	HSG.SRT.B.5

	Topics	Knowledge Points	Common Core
8	**Similar Triangles-Part 1**	1. Similar Polygons 2. AA Similarity	HSG.SRT.B.5
9	**Similar Triangles-Part 2**	1. Theorems of Similar Triangles 2. Proportional Lengths	HSG.SRT.C.7
10	**Right Triangles**	1. Similarity in Right Triangles 2. The Pythagorean Theorem	HSG.SRT.B.8
11	**Trigonometric Functions of Acute Angles**	1. Definition of Trigonometric Functions 2. Trigonometric Function Values of Special Angles	HSG.SRT.A.2 HSG.SRT.A.3
12	**Application of Trigonometric Functions**	1. Special Right Triangles 2. Similar Triangles and Trigonometric Functions 3. Solve Triangles	HSG.SRT.A.2 HSG.SRT.A.3
13	**Area of Triangles and Quadrilaterals**	1. Area of Triangles and Quadrilaterals	
14	**Area of Polygons**	1. Area of Regular Polygons 2. Ratios of Areas	
15	**Basic Terms of Circles**	1. The Basic Concept of Circles 2. Theorems of Chords	HSG.C.A.1

Syllabus for Geometry

2025 Fall Challenge

	Topics	Knowledge Points	Common Core
1	**Parallelograms**	1. Properties of Parallelogram 2. Ways to Prove that Quadrilaterals are Parallelograms	HSG.CO.C.11
2	**Rhombi and Rectangles**	1. Midsegment of a Triangle 2. Rectangles 3. Rhombi	HSG.CO.C.11
3	**Squares and Trapezoids**	1. Squares 2. Trapezoids	HSG.CO.C.11
4	**Similar Triangles-Part 1**	1. Similar Polygons 2. Ways to Prove Triangles Similar	HSG.SRT.B.5
5	**Similar Triangles-Part 2**	1. Parallel Lines, "A" Model and "8" Model 2. Reversed "A" Model and "8" Model	HSG.SRT.C.7
6	**Basic Terms of Circles**	1. Basic Terms of Circles 2. Theorems of Chords	HSG.C.A.1
7	**Angles in Circles - Part 1**	1. Central Angles 2. Inscribed Angles	HSG.C.A.2
8	**Position of Points and Lines with respect to a Circle**	1. Position of Points with respect to a Circle 2. Position of Lines with respect to a Circle	HSG.C.A.4
9	**Power of a Point**	1. Intersecting Chords Theorem 2. Tangent-Secant Theorem 3. Intersecting Secants Theorem	HSG.C.A.2
10	**Angles in Circles - Part 2**	1. Cyclic Quadrilateral 2. Other Angles	HSG.C.A.2
11	**Area of Circles and Sectors**	1. Area of Circles 2. Area of Sectors	HSG.C.B.5
12	**Prisms and Pyramids**	1. Prisms 2. Pyramids	HSG.GMD.A.1 HSG.GMD.A.2 HSG.GMD.A.3
13	**Cylinders and Cones**	1. Volumes and Surface Areas of Cylinders 2. Volumes and Surface Areas of Cones	HSG.GMD.A.1 HSG.GMD.A.2 HSG.GMD.A.3
14	**Similar solids and Spheres**	1. Similar Solids 2. Spheres	HSG.GMD.A.1 HSG.GMD.A.2 HSG.GMD.A.3
15	**Coordinate Proofs**	1. Organizing Coordinate Proofs 2. Coordinate Proofs	

Syllabus for Algebra 2

2025 Fall

	Topics	Knowledge Points	Common Core
1	**Operations and Properties of Functions**	1. Function Operations 2. Composition of Functions 3. Even and Odd Functions 4. Inverse Functions	HSF.BF.1
2	**Quadratic Functions**	1. Transformation of Quadratic Functions 2. Graph Quadratic Functions and Inequalities 3. Solving System of Nonlinear Equations	HSF.IF.7
3	**Exponential Functions**	1. Graphs and Properties of Exponential Functions 2. Transformations of Exponential Functions 3. Natural Base	HSF.IF.7
4	**Logarithms**	1. Definition of Logarithms 2. Properties of Logarithms 3. Change of Base Formula	HSF.IF.7
5	**Logarithmic Functions**	1. Definitions of Logarithmic Function 2. Graphs of Logarithmic Function 3. Properties of Logarithmic Function	HSF.IF.7
6	**Exponential and Logarithmic Equations**	1. Solve Exponential Equations 2. Solve Logarithmic Equations 3. Solve Exponential and Logarithmic Inequalities	
7	**Rational Functions**	1. Definitions of Rational Function 2. Graphs of Rational Function 3. Properties of Rational Function	HSF.IF.7
8	**Right Triangle Trigonometry**	1. Review: Evaluate Sine, Cosine and Tangent 2. Definition of Cosecant, Secant and Cotangent 3. Trigonometric Function Values of Special Angles 4. Find the Missing Side Length 5. Radian Measure	HSF.TF.1-4
9	**Trigonometric Functions of Any Angles**	1. Standard Position 2. Coterminal Angles 3. Evaluate Trigonometric Functions Given a Point	HSF.TF.8-9
10	**Pythagorean Identities**	1. Relation between Sine and Cosine 2. Relation between Secant and Tangent 3. Relation between Cosecant and Cotangent	HSF.TF.5-7
11	**Conversion Identities**	1. Identities of Coterminal Angles 2. Identities of Supplementary Angles 3. Identities of Complementary Angles 4. Identities for Negative Angles	HSF.TF.5-7
12	**Graphs of Trigonometric Functions**	1. Graph and Properties of Sine 2. Graph and Properties of Cosine 3. Graph and Properties of Tangent	HSF.TF.5-7
13	**Transformations of Graphs of Trigonometric Functions**	1. Vertical Translation 2. Horizontal Translation 3. The Change of Amplitude and Period by Coefficient	HSG.SRT.9-11
14	**The Law of Sines and Cosines - Part 1**	1. The Law of Sines 2. The Circumradius 3. The Area of Triangles	HSG.SRT.9-11
15	**The Law of Sines and Cosines - Part 2**	1. The Law of Cosines 2. Applications of the Law of Cosines 3. Problems Solving in Triangles	HSG.SRT.9-11

Syllabus for AMC 8 HR Camp

2025 Fall

	Topic	Content	Module
1	**Exponentiation & Factorials**	Expanding computational thinking skills, build on the concepts of exponents and factorials to solve more complex calculation problems.	Number Theory
2	**Similarity & Geometric Models**	Review the concept of Similarity and be able to apply similarity properties to solve geometric problems. Learn advanced geometric models and learn to analyze diagrams, uncover hidden conditions, and solve problems.	Geometry
3	**Principle of Extremum & Principle of Inclusion-Exclusion**	Review the principles of extreme and inclusion-exclusion, and apply algebra and number theory knowledge to solve practical problems.	Combinatorics
4	**Traveling Word Problems**	Reviewing the three key elements of Traveling Problems. Revisit the concepts of meeting and chasing, and explore more complex traveling problems involving proportional relationships.	Word Problems
5	**Inequalities**	Understand inequalities, learn their properties, and develop the ability to solve them.	Numbers & Operations
6	**Factors & Multiples**	Review the basic methods for finding the greatest common divisor (GCD) and least common multiple (LCM), and apply them to problem-solving. Revisit the theorem of the number of factors of a number, understand its principles, and use it to solve practical problems.	Number Theory
7	**Percentages & Statistical Problems**	Conduct a comprehensive review of various percentage-based problems, including concentration, discount, and interest calculations. Learn to solve complex statistical application problems.	Word Problems
8	**Solid Geometry**	Review the concepts of surface area and volume, and solve comprehensive and complex solid geometry problems. Deepen understanding of 3D shapes through advanced studies of immersion in water and coloring problems, enhancing spatial thinking.	Geometry
9	**Linear Functions & Coordinate Systems**	Learn the fundamental concepts of linear functions covered in the AMC 8 exam, and perform calculations involving independent and dependent variables. Develop the ability to solve geometric problems in the coordinate plane.	Numbers & Operations
10	**Permutations & Combinations**	Review the basic calculation methods and properties of permutations and combinations. Deepen understanding of common techniques such as the bundling method, gap method, and case analysis, and develop the ability to independently analyze problems and select appropriate methods.	Statistics, Counting & Probability
11	**Curve Geometry**	Review shapes related to circles, and use the relationships of inscribed and circumscribed squares to solve complex geometric problems.	Geometry
12	**Probability**	Integrate statistical knowledge to solve complex probability problems.	Statistics, Counting & Probability
13	**Remainder Theorem**	Review the properties of remainders, and solve number theory problems using the properties of remainders, the congruence theorem, and the Chinese remainder theorem.	Number Theory
14	**Advanced Counting & Probability**	The focus of this lesson is to tackle counting problems and probability problems at the difficulty level of AMC 8 final questions.	Statistics, Counting & Probability
15	**Advanced Geometry Problem**	Continuously expand on complex problems in solid geometry and curve geometry, aiming to master full-score geometry questions in the AMC 8 exam.	Geometry

Syllabus for AMC 10 Intro Camp

2025 Fall

	Topic	Contents
1	**The Pythagorean Theorem**	1. The Pythagorean Theorem 2. Special Right Triangles 3. Using Equations to Solve Length
2	**Properties of Triangles**	1. Inequalities in Triangles 2. Angle Bisector 3. Median 4. Altitude
3	**Properties of Quadrilateral**	1. Parallelogram 2. Rhombus
4	**Ways to Prove Triangles Similar**	1. Similar Polygons 2. Ways to Prove Triangles Similar 3. "A" Model
5	**Models of Similar Triangles**	1. "8" Model 2. Complicated "A" and "8" Model 3. Reversed "A" Model and "8" Model
6	**Modular Arithmetic**	1. Modulo and Congruence 2. Addition and Subtraction 3. Multiplication and Exponentiation 4. Remainder Problems
7	**Permutation and Combination**	1. Enumeration Methods 2. Binding Methods 3. Filling in the Blanks Method 4. Stars and Bars Method

	Topic	Contents
8	**Classical Probabilities**	1. Classical Probabilities 2. Complementary Events 3. Dice Problems 4. Counting and Probabilities
9	**Angles in Circles**	1. Theorems of Chords 2. Central Angles and Inscribed Angles 3. Relations between Central Angles and Inscribed Angles 4. Cyclic Quadrilaterals
10	**Position of Points and Lines with respect to a Circle**	1. Position of Points with respect to a Circle 2. Position of Lines with respect to a Circle
11	**Relative Positions of Two Circles**	1. Relative Positions of Two Circles 2. Different Types of Tangents
12	**Area of Circles and Sectors**	1. Area of Circles 2. Area of Sectors
13	**Prisms, Pyramids and Polyhedra**	1. Prisms 2. Pyramids 3. Polyhedra
14	**Cylinders and Cones**	1. Volumes and Surface Areas of Cylinders 2. Volumes and Surface Areas of Cones
15	**Conical Frustums and Spheres**	1. Conical Frustums 2. Spheres

Syllabus for Precalculus

2025 Fall

	Topic	Content
1	**Relation and Functions**	1. Relations and Functions 2. Domain and Range 3. Increasing and Decreasing 4. Parity of a Function
2	**Rate of Change**	1. Rate of Change 2. Rate of Change in Linear Functions 3. Rate of Change in Quadratic Functions
3	**Polynomial Functions**	1. Relative and Absolute Extrema 2. Zeros of Polynomial Functions 3. End Behavior and Polynomial Functions 4. Graph Polynomial Functions 5. Polynomial Inequalities
4	**Rational Expressions and Rational Functions**	1. Addition and Subtraction of Rational Expressions 2. Multiplication and Division of Rational Expressions 3. Rational Function and Zeros
5	**Graph of Rational Functions**	1. Rational Functions and Vertical Asymptotes 2. Rational Functions and End Behavior 3. Graph Rational Functions
6	**Rational Equations and Inequalities**	1. Rational Equations 2. Rational Inequalities
7	**Parent Functions**	1. Basic Functions 2. Transformation of Basic Functions 3. Function Modeling

	Topic	Content
8	**Composition of Functions and Inverse Functions**	1. Composition of Functions 2. Inverse Functions
9	**Exponential Functions**	1. Exponential Functions 2. Transformation of Exponential Function 3. Exponential Function Modeling
10	**Logarithmic Functions**	1. Logarithmic Functions 2. Transformation of Logarithmic Functions 3. Logarithmic Function Modeling
11	**Exponential and Logarithmic Equation and Inequalities**	1. Exponential and Logarithmic Equation 2. Exponential and Logarithmic Inequalities 3. Inverse Equations
12	**Sinusoidal Functions**	1. Sinusoidal Functions 2. Transformations of Sinusoidal Functions 3. Modeling with Sinusoidal Functions
13	**The Tangent Function**	1. The Tangent Functions 2. Inverse Trigonometric Functions 3. The Secant, Cosecant and Cotangent Functions
14	**Trignometric Identities**	1. Pythagorean Identity 2. Angle Addition Formulas 3. Double Angle Formulas
15	**Trigonometric Equations and Inequalities**	1. Trignometric Equations 2. Trigonometric Inequalities