Think Academy

Pre-K Spring Syllabus

	Topic	Knowledge Point	Content	Ability
1	**Chase it!**	**Visual Tracking**	Extend students' attention duration, enhance their attention stability, and help them better adapt to the class through difference contrast and visual tracking practices.	**Reasoning**
2	**Taking Photos**	**Pictures in Different Views**	Through multi-angle observation, discover the differences in object views, gradually transitioning from real objects to abstract graphics, laying a foundation for spatial imagination ability.	**Spatial Sense**
3	**Step by Step**	**Map and Direction**	By learning map basics, students can distinguish between real photos and maps, understand basic map elements, read simple maps, and identify directions (up, down, left, right). They will also gain a basic understanding of world orientation and be able to express it.	**Expression**
4	**Tidy Up**	**Statistical Graph**	Approach multi-angle classification: classify the same group of items from multiple perspectives such as size, color, shape, and type. According to the statistical table, classify and count the items, and compare and express the results.	**Measurement and Data**
5	**Kingdom of Origami**	**Origami**	Through hands-on practice, children can understand the basic folding methods of origami, and be able to independently complete simple origami works. By combining "hole punching games" with mathematical and corresponding thinking, children can exercise their independent hands-on operation ability and spatial imagination ability.	**Creativity**
6	**One Day in Cannery**	**Number Bond**	By using real objects, explore the orderly separation of quantities through hands-on activities, and understand the relationship between the whole and the parts. Combine with real-life scenarios to solve problems related to the combination and separation of quantities in daily life.	**Number**
7	**Shape Beauty Contest**	**Polygon**	Learn polygons on the basis of understanding basic plane shapes. Guide children to observe polygons with different numbers of sides. Find common polygons in life and improve their observation of shapes.	**Spatial Sense**
8	**Party at Beach**	**Subtraction in 10**	Explore "decrease" of objects in life and solve the problem of "how much is left" by counting back. Students will describe the change in quantity with subtraction expression using minus and the equal signs, and solve subtraction problems within 10.	**Number**
9	**Rolling Shapes**	**Introduction to Solid Figure**	Recognize and feel three-dimensional shapes. Students will learn to distinguish cylinders, cones, and spheres (roll, stack). Through tactile games in class, they will experience the characteristics of different shapes and learn about their faces.	**Spatial Sense**
10	**Squary the Pirate**	**Elimination**	In the interesting story, lead the children to experience the magic of elimination method, cultivate the thinking habit of orderly thinking and the ability to solve problems.	**Reasoning**
11	**Top it up**	**Addition Word Problem**	Students will learn how addition within 10 can solve problems encountered in everyday life. They will also understand the two meanings of addition: combining and increasing quantities.	**Number**
12	**Lost in Castle**	**3D Maze**	By solving maze problems, students can improve their spatial sense and problem-solving skills. In class, students will learn how to analyze and solve problems, as well as how to create and design their own mazes. Help students improve their hand-eye coordination, and cultivate their creativity and logical thinking skills.	**Spatial Sense**
13	**Float and Sink**	**Buoyancy Test**	Identify which items will float or sink based on their daily experiences. Students will then conduct experiments to observe and record how different objects behave in water.	**Creativity**
14	**Who is Taller?**	**Non-standard Measurement**	Students will learn to use an item as a standard unit to measure other items. Additionally, they need to understand the principles and usage of a standard balance scale.	**Measurement and Data**
15	**Wowowowo**	**Exchange with Balanced Scales**	With the help of the exchange rules in ancient times, learn the method of equivalent exchange through observation and hands-on activities. Establish basic logical thinking in life scenes.	**Reasoning**
16	**Piggy Bank**	**Subtraction Word Problem**	Students will learn how subtraction within 10 can solve problems encountered in everyday life. They will also understand the two meanings of subtraction: removing a part and decreasing quantities.	**Number**
17	**Tumble Jumble**	**Block Building**	Students need to understand the construction methods of tree-view drawings by assembling and arranging cubes. Additionally, by playing a 'through-the-wall' game, they can initially experience how tree-view drawings change from different perspectives.	**Spatial Sense**
18	**Journey to the Cave**	**Positional Reasoning**	Understanding the rules of card games, mastering skills and methods, and inferring the correct order and results. In this process, exercise children's step-by-step thinking and overall layout ability, and cultivate strategic thinking.	**Reasoning**

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Kindergarten Spring Syllabus H

	Topic	Knowledge Point	Content	Ability
1	Secrets in Graph	Understand Graph	Learn to read and get information from picture graphs and bar graphs. This enhances students' data interpretation and analytical skills.	Measurement and Data
2	Number Clash Adventure	Comparison of Numbers within 100	Learn to understand greater than and less than signs, compare numbers within 100, and sort multiple numbers based on their values. It can enhance students' ability in numerical comparison.	Number
3	Priceless Treasure	Understand Full Hours	Understand clocks and recognize whole hours. This enhances students' time-telling skills.	Measurement and Data
4	Rotating Restaurant	Complex Pattern	Introduce students to rotational patterns by exploring how single shapes or objects appear when rotated. Students will discover the fascinating principles of rotation and the complex rules of composition.	Reasoning
5	The Beauty of the Nature	Number Bond	Understand number bonds and learn to use parts to find the whole, or find the missing part with the whole and part.This enhances students' arithmetic skills and their ability to solve part-whole relationship problems.	Number
6	Treasure on the Island	Number Puzzles in Grids	Develop the reasoning ability by solving the number puzzles in grids and experiencing the fun of "treasure hunting". Students will explore the breakthrough points and methods to complete the puzzles.	Reasoning
7	Everyday Enigmas	Experimental Inquiry	Help students understand some special design and interesting phenomenon through experiment.This improves students' critical thinking and observational skills.	Critical Thinking
8	Simon Says	Identify Positions	Understand your own left and right and others' left and right.This enhances students' spatial awareness and directional skills.	Spatial Sense
9	Build a Skyscraper	Tower of Hanoi	Understand the rules of Hanoi Tower and know how to move several disks from one tower to another with the fewest steps. This enhances students' logical thinking and strategic planning skills.	Creativity
10	Welcome to Mathland!	Simple Number Puzzles	Understand number puzzle in a line and a triangle. Be able to find the missing number with the given sum.This enhances students' numerical reasoning.	Number
11	Home of Little Bee	Identify Regular Shapes	Learn to use shapes to do tiling and complete shapes based on given parts. This enhances students' spatial reasoning and their hands-on skills.	Creativity
12	Mocha Warriors	Positional Reasoning	Understand the rules of a card game with clues on positions. Practice logical reasoning skills to find correct position for each card. It helps to cultivate children's strategic thinking.	Reasoning
13	Cut and Count	Counting Shapes	Learn the concept of "splitting and completing" geometric shapes. Practice by first dividing the shape into parts, then completing it to form a half. This activity enhances children's spatial reasoning and problem-solving skills, fostering mathematical thinking.	Spatial Sense
14	The Strange Hat	Three Views	Understand three views of physical objects and cube combinations. This enhances students' spatial visualization and geometric reasoning skills.	Spatial Sense
15	Animal Chess	Sudoku	Determine the number of visible cubes from each direction and learn to complete the puzzles accordingly. It enhances students' spatial reasoning and problem-solving skills.	Reasoning
16	In Line For A Movie	Lining Up Problems	Understand positions using ordinal numbers and identify the number of people before and after a main character by drawing the line. This enhances students' comprehension of ordinal numbers and their problem-solving skills.	Number
17	Mysterious Market	Equivalent Substitution	Learn how to compare weight of items on balance scales by packing and swapping. This enhances students' understanding of balance concepts and how to compare weight.	Reasoning
18	Whose Building is the Tallest?	Solid Shapes	Explore the relationship between edges and load-bearing capacity in 3D shapes and the impact of height on load-bearing capacity. This enhances students' understanding of structural engineering principles and their manual ability.	Creativity

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Kindergarten Spring Syllabus C

	Topic	Knowledge Point	Content	Ability
1	**Secrets in Graph**	**Understand Graph**	Learn to read and get information from picture graphs and bar graphs. This enhances students' data interpretation and analytical skills.	**Measurement and Data**
2	**Number Clash Adventure**	**Comparison of Numbers within 100**	Learn to understand greater than and less than signs, compare numbers within 100, and sort multiple numbers based on their values. It can enhance students' ability in numerical comparison.	**Number**
3	**Priceless Treasure**	**Understand Full Hours**	Understand clocks and recognize whole hours. This enhances students' time-telling skills.	**Measurement and Data**
4	**Rotating Restaurant**	**Complex Pattern**	Introduce students to rotational patterns by exploring how single shapes or objects appear when rotated. Students will discover the fascinating principles of rotation and the complex rules of composition.	**Reasoning**
5	**The Beauty of the Nature**	**Number Bond**	Understand number bonds and learn to use parts to find the whole, or find the missing part with the whole and part.This enhances students' arithmetic skills and their ability to solve part-whole relationship problems.	**Number**
6	**Treasure on the Island**	**Number Puzzles in Grids**	Develop the reasoning ability by solving the number puzzles in grids and experiencing the fun of "treasure hunting". Students will explore the breakthrough points and methods to complete the puzzles.	**Reasoning**
7	**Everyday Enigmas**	**Experimental Inquiry**	Help students understand some special design and interesting phenomenon through experiment.This improves students' critical thinking and observational skills.	**Critical Thinking**
8	**Simon Says**	**Identify Positions**	Understand your own left and right and others' left and right.This enhances students' spatial awareness and directional skills.	**Spatial Sense**
9	**How Delicious**	**Addition Strategy in 20**	Learn addition within 20 using fun and effective strategies, such as number bonds, making ten with visual aids, and smart techniques for adding three numbers. This course helps develop children's arithmetic skills, enhances number sense, and promotes logical thinking.	**Number**
10	**Welcome to Mathland!**	**Simple Number Puzzles**	Understand number puzzle in a line and a triangle. Be able to find the missing number with the given sum.This enhances students' numerical reasoning.	**Number**
11	**Home of Little Bee**	**Identify Regular Shapes**	Learn to use shapes to do tiling and complete shapes based on given parts. This enhances students' spatial reasoning and their hands-on skills.	**Creativity**
12	**Mocha Warriors**	**Positional Reasoning**	Understand the rules of a card game with clues on positions. Practice logical reasoning skills to find correct position for each card. It helps to cultivate children's strategic thinking.	**Reasoning**
13	**Cut and Count**	**Counting Shapes**	Learn the concept of "splitting and completing" geometric shapes. Practice by first dividing the shape into parts, then completing it to form a half. This activity enhances children's spatial reasoning and problem-solving skills, fostering mathematical thinking.	**Spatial Sense**
14	**The Strange Hat**	**Three Views**	Understand three views of physical objects and cube combinations. This enhances students' spatial visualization and geometric reasoning skills.	**Spatial Sense**
15	**Animal Chess**	**Sudoku**	Determine the number of visible cubes from each direction and learn to complete the puzzles accordingly. It enhances students' spatial reasoning and problem-solving skills.	**Reasoning**
16	**In Line For A Movie**	**Lining Up Problems**	Understand positions using ordinal numbers and identify the number of people before and after a main character by drawing the line. This enhances students' comprehension of ordinal numbers and their problem-solving skills.	**Number**
17	**Mysterious Market**	**Equivalent Substitution**	Learn how to compare weight of items on balance scales by packing and swapping. This enhances students' understanding of balance concepts and how to compare weight.	**Reasoning**
18	**Magic 10**	**Subtraction Strategy in 20**	Learn subtraction within 20 through various strategies, including breaking down two-digit numbers (e.g., 14-4 or 14-10), non-borrowing subtraction, and the "break ten" method. Practice arithmetic skills to strengthen number sense and logical thinking, helping to build a solid foundation in mental math.	**Number**

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G1 Spring Syllabus H

	Topic	Knowledge Point	Content	Ability
1	**Graph Genius**	**Bar Graph**	Learn to master the concepts and applications of bar graphs, solving various problems by combining these concepts for more complex scenarios. These skills will enhance students' logical reasoning and problem-solving abilities in contexts related to statistical charts.	**Measurement and Data**
2	**Dice Dynamics**	**Introduction to Dice**	Learn to understand the properties of dice and the principles governing their interactions, including how to determine opposite faces when multiple dice are involved. Students will impreve their spatial reasoning skills.	**Spatial Sense**
3	**Calculate Magic**	**Advanced Addition and Subtraction Strategies**	Recognize and solve questions using efficient calculation techniques. Students will understand how these methods are applied and how to identify the rules.	**Number**
4	**Puzzle Pathways**	**Klotski**	Learn to understand and apply the rules of Klotski puzzles, enhancing their logical thinking and strategic planning skills.Students will be able to solve complex problems involving piece movement and puzzle restoration.	**Reasoning**
5	**Compare Quest**	**Comparative Word problems**	Learn to understand and apply the concept of comparative word problems, accurately determine unknown values through comparisons, and solve increasingly complex scenarios. Students will understand comparison techniques and improve their problem-solving abilities.	**Number**
6	**Block Builders**	**Building Blocks**	Learn to use building blocks to solve both basic and complex combination problems.These skills will enhance students' ability to visualize and analyze different block combinations effectively.	**Creativity**
7	**Shape Math**	**Calculation with Shapes**	Explore the concept of pictorial equations. Students will be able to use formulas to calculate areas of various geometric shapes. They learn how to work backward to find missing numbers.	**Reasoning**
8	**Move it, Move it!**	**Move for Fairness**	Learn to correctly use the concept of balancing quantities by moving and adjusting amounts, particularly with visual aids or without them, and determine differences accurately. These skills will enhance students' problem-solving abilities in quantitative reasoning.	**Number**
9	**Number Maze**	**Number Matrix**	Learn to understand the characteristics of number decomposition, enumerate possible combinations, and accurately break down numbers into specified parts. These skills will enhance students' numerical reasoning, understanding of number properties, and problem-solving abilities related to enumeration and decomposition.	**Reasoning**
10	**Number Engineer**	**Split Numbers**	Learn to understand the concept of number splitting, master ordered enumeration techniques, identify patterns in number combinations, and solve problems involving various splitting models. These skills will enhance students' understanding of numerical relationships and strengthen their logical reasoning.	**Number**
11	**Dimension Detective**	**Three View Combination**	Learn to understand three-view diagrams, accurately interpret and draw individual 3D shapes, and combine multiple shapes into composite views. These skills will enhance students' spatial reasoning, visualization abilities, and problem-solving skills in geometric contexts.	**Spatial Sense**
12	**Revisit the Past**	**Inverse Problems**	Learn to solve restoration problems, understand the processes involved, and apply logical reasoning to reconstruct original quantities. These skills will enhance students' problem-solving abilities in scenarios involving partial information and transformations.	**Number**
13	**Time Mastery**	**Time Planning**	Learn to understand time management concepts, create schedules using Gantt charts, and apply logical reasoning to coordinate simultaneous activities. These skills will enhance students' planning abilities, problem-solving skills, and systematic thinking in managing time effectively.	**Expression**
14	**Numeric Mysteries**	**Addition and Subtraction Column Puzzle**	Learn to apply strategies and analytical techniques to solve vertical addition and subtraction puzzles efficiently. These skills will enhance students' numerical reasoning and problem-solving abilities in arithmetic contexts.	**Reasoning**
15	**Shape Explorer**	**Solid Shapes and Nets**	Learn to recognize and understand 3D shapes, including prisms, cones, frustums, and spheres, as well as how to construct these shapes. Additionally, students will learn to identify and work with the nets of these shapes, enhancing their spatial reasoning skills.	**Creativity**
16	**Little Investigator**	**Comparative and Reasoning with Positions**	Learn to apply positional reasoning techniques, including direct comparisons and more complex relational analysis. Students will be able to understand key concepts of spatial relationships and interpret positional information effectively.	**Reasoning**
17	**Time Crunch**	**Calculating Time**	Learn to accurately calculate time, including determining start times, end times, and elapsed time. These skills will enhance students' understanding of time calculations.	**Measurement and Data**
18	**Code Crackers**	**Finding the Code**	Learn to develop and apply decoding strategies for different types of ciphers, enhancing students' cryptographic skills. These techniques will enable students to understand and interpret various coded messages.	**Reasoning**

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G1 Spring Syllabus C

	Topic	Knowledge Point	Content	Ability
1	**Graph Genius**	**Bar Graph**	Learn to master the concepts and applications of bar graphs, solving various problems by combining these concepts for more complex scenarios. These skills will enhance students' logical reasoning and problem-solving abilities in contexts related to statistical charts.	**Measurement and Data**
2	**Shape Explorer**	**Solid Shapes and Nets**	Learn to recognize and understand solid shapes, including prisms, cones, cylinders, and spheres, as well as how to construct these shapes. Additionally, students will learn to identify and work with the nets of these shapes, enhancing their spatial reasoning skills.	**Creativity**
3	**Calculate Magic**	**Advanced Addition and Subtraction Strategies**	Recognize and solve questions using efficient calculation techniques. Students will understand how these methods are applied and how to identify the rules.	**Number**
4	**Puzzle Pathways**	**Klotski**	Learn to understand and apply the rules of Klotski puzzles, enhancing their logical thinking and strategic planning skills.Students will be able to solve complex problems involving piece movement and puzzle restoration.	**Reasoning**
5	**Compare Quest**	**Comparative Word problems**	Learn to understand and apply the concept of comparative word problems, accurately determine unknown values through comparisons, and solve increasingly complex scenarios. Students will understand comparison techniques and improve their problem-solving abilities.	**Number**
6	**Block Builders**	**Building Blocks**	Learn to use building blocks to solve both basic and complex combination problems.These skills will enhance students' ability to visualize and analyze different block combinations effectively.	**Creativity**
7	**Shape Math**	**Calculation with Shapes**	Explore the concept of pictorial equations. Students will be able to use formulas to calculate areas of various geometric shapes. They learn how to work backward to find missing numbers.	**Reasoning**
8	**Move it, Move it!**	**Move for Fairness**	Learn to correctly use the concept of balancing quantities by moving and adjusting amounts, particularly with visual aids or without them, and determine differences accurately. These skills will enhance students' problem-solving abilities in quantitative reasoning.	**Number**
9	**Number Maze**	**Number Matrix**	Learn to understand the characteristics of number decomposition, enumerate possible combinations, and accurately break down numbers into specified parts. These skills will enhance students' numerical reasoning, understanding of number properties, and problem-solving abilities related to enumeration and decomposition.	**Reasoning**
10	**Number Engineer**	**Split Numbers**	Learn to understand the concept of number splitting, master ordered enumeration techniques, identify patterns in number combinations, and solve problems involving various splitting models. These skills will enhance students' understanding of numerical relationships and strengthen their logical reasoning.	**Number**
11	**Dimension Detective**	**Three View Combination**	Learn to understand three-view diagrams, accurately interpret and draw individual 3D shapes, and combine multiple shapes into composite views. These skills will enhance students' spatial reasoning, visualization abilities, and problem-solving skills in geometric contexts.	**Spatial Sense**
12	**Revisit the Past**	**Inverse Problems**	Learn to solve restoration problems, understand the processes involved, and apply logical reasoning to reconstruct original quantities. These skills will enhance students' problem-solving abilities in scenarios involving partial information and transformations.	**Number**
13	**Time Mastery**	**Time Planning**	Learn to understand time management concepts, create schedules using Gantt charts, and apply logical reasoning to coordinate simultaneous activities. These skills will enhance students' planning abilities, problem-solving skills, and systematic thinking in managing time effectively.	**Expression**
14	**Numeric Mysteries**	**Addition and Subtraction Column Puzzle**	Learn to apply strategies and analytical techniques to solve vertical addition and subtraction puzzles efficiently. These skills will enhance students' numerical reasoning and problem-solving abilities in arithmetic contexts.	**Reasoning**
15	**Understand Multiplication**	**x but not cross**	Understand the concept of multiplication and use a multiplication table to help with calculations. Cultivate children's number sense.	**Number**
16	**Little Investigator**	**Comparative and Reasoning with Positions**	Learn to apply positional reasoning techniques, including direct comparisons and more complex relational analysis. Students will be able to understand key concepts of spatial relationships and interpret positional information effectively.	**Reasoning**
17	**Time Crunch**	**Calculating Time**	Learn to accurately calculate time, including determining start times, end times, and elapsed time. These skills will enhance students' understanding of time calculations.	**Measurement and Data**
18	**Code Crackers**	**Finding the Code**	Learn to develop and apply decoding strategies for different types of ciphers, enhancing students' cryptographic skills. These techniques will enable students to understand and interpret various coded messages.	**Reasoning**

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G2 Spring Syllabus

H

	Topic	Knowledge Point	Content	Ability
1	**Area Aces**	**Understand 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**
2	**Clockwork Mechanics**	**Gears Turning**	Learn to understand gears and the principles of gear movement, including how gears change direction and speed during rotation. Students will understand the effects of gear interactions.	**Creativity**
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	**Round and Round**	**Find the Cycle**	Understand what a cycle is and identify cycles in word problems. Use the relationships between the cycle and remainder to find the item based on the given position, and to calculate the total number of items in cycle.	**Number (word problem)**
5	**Sum Up Segments**	**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)**
6	**VIP Room**	**Add and Remove Parentheses**	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**
7	**Perfect Partitions**	**Shape Division**	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**
8	**Difference in Segments**	**Difference-Multiples 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)**
9	**Gaming Buddy**	**Rolling the Dice**	According to the characteristics of standard dice, find the pattern of the rolling dice, and then solve problems.	**Creativity**
10	**Growing Up Chronicles**	**Age Problems**	Understand characteristics including the differences and sums of ages. Convert age problems into sums, differences, and multiples problems to better analyze and solve them.	**Number (word problem)**
11	**Magic Dot**	**Understand Decimals**	Understand the meaning of decimals and the relationship between fractions and decimals. Compare decimals according to place values, and solve problems in real life.	**Number**
12	**Temperature Reporter**	**Thermometer Puzzle**	Learn to apply logical reasoning to solve thermometer puzzles. These skills will enhance students' logical reasoning, problem-solving abilities, and systematic thinking in puzzle-solving scenarios.	**Reasoning**
13	**Match and Pop**	**Advanced Operations without Number**	Learn how to solve equations with pictures by adding and subtracting them based on their characteristics. Enhance logical reasoning ability and introduce the basic concept of algebra.	**Reasoning**
14	**My Best Friend**	**Multiplication and Division Strategies**	Learn to apply strategies and rearrangement techniques to simplify and solve multiplication and division problems efficiently.	**Number**
15	**Data Genie**	**Data Analysis in Graphs**	Explore the basic statistical concepts. Learn to find or calculate the average, mode, median, and range in bar and line graphs. Build an understanding of statistics.	**Measurement and Data**
16	**Finance Expert**	**Addition and Subtraction of Decimals**	Understand the addition and subtraction methods of decimals. Learn how to calculate simple operations mentally, and calculate complex operations with column addition and subtraction. Solve some real-life problems.	**Number**
17	**All the Way Around**	**Strategies of Finding Perimeter**	Learn to accurately calculate the perimeter of irregular shapes by the translation method. Use hands-on methods to experience changes in perimeter to solve problems. These skills will enhance students' geometric understanding.	**Spatial Sense**
18	**Victory Forever**	**Winning Strategy**	Learn to develop and apply winning strategies for games involving different step moves per turn, both with and without remainder considerations.	**Expression**

Think Academy

G2 Spring Syllabus C

	Topic	Knowledge Point	Content	Ability
1	**Area Aces**	**Understand 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**
2	**Clockwork Mechanics**	**Gears Turning**	Learn to understand gears and the principles of gear movement, including how gears change direction and speed during rotation. Students will understand the effects of gear interactions.	**Creativity**
3	**Number Tower**	**Number Patterns in Shapes**	Explore the square number pattern and pyramid pyramid number pattern by observing figures.Distinguish different patterns and solve complex number patterns.	**Number**
4	**Round and Round**	**Find the Cycle**	Understand what a cycle is and identify cycles in word problems. Use the relationships between the cycle and remainder to find the item based on the given position, and to calculate the total number of items in cycle.	**Number (word problem)**
5	**Sum Up Segments**	**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)**
6	**VIP Room**	**Add and Remove Parentheses**	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**
7	**Perfect Partitions**	**Shape Division**	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**
8	**Difference in Segments**	**Difference-Multiples 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)**
9	**Gaming Buddy**	**Rolling the Dice**	According to the characteristics of standard dice, find the pattern of the rolling dice, and then solve problems.	**Creativity**
10	**Growing Up Chronicles**	**Age Problems**	Understand characteristics including the differences and sums of ages. Convert age problems into sums, differences, and multiples problems to better analyze and solve them.	**Number (word problem)**
11	**Magic Dot**	**Understand Decimals**	Understand the meaning of decimals and the relationship between fractions and decimals. Compare decimals according to place values, and solve problems in real life.	**Number**
12	**Temperature Reporter**	**Thermometer Puzzle**	Learn to apply logical reasoning to solve thermometer puzzles. These skills will enhance students' logical reasoning, problem-solving abilities, and systematic thinking in puzzle-solving scenarios.	**Reasoning**
13	**Match and Pop**	**Advanced Operations without Number**	Learn how to solve equations with pictures by adding and subtracting them based on their characteristics. Enhance logical reasoning ability and introduce the basic concept of algebra.	**Reasoning**
14	**My Best Friend**	**Multiplication and Division Strategies**	Learn to apply strategies and rearrangement techniques to simplify and solve multiplication and division problems efficiently.	**Number**
15	**Data Genie**	**Data Analysis in Graphs**	Explore the basic statistical concepts. Learn to find or calculate the average, mode, median, and range in bar and line graphs. Build an understanding of statistics.	**Measurement and Data**
16	**Finance Expert**	**Addition and Subtraction of Decimals**	Understand the addition and subtraction methods of decimals. Learn how to calculate simple operations mentally, and calculate complex operations with column addition and subtraction. Solve some real-life problems.	**Number**
17	**All the Way Around**	**Strategies of Finding Perimeter**	Learn to accurately calculate the perimeter of irregular shapes by the translation method. Use hands-on methods to experience changes in perimeter to solve problems. These skills will enhance students' geometric understanding.	**Spatial Sense**
18	**Victory Forever**	**Winning Strategy**	Learn to develop and apply winning strategies for games involving different step moves per turn, both with and without remainder considerations.	**Expression**

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G2 Spring Syllabus ACE

	Knowledge Point	Content	Ability
1	**Long Division**	Learn about long division, including the place for the remainders. Be able to divide three-digit numbers by one-digit numbers using long division. Master division involving 0.	**Number**
2	**Number Patterns in Shapes**	Observe number patterns in triangles and squares. Combine numbers with shapes to calculate the sum of a pyramid sequence quickly. Cultivate the ability of observation and calculation.	**Number**
3	**Clockwork Mechanics**	Learn to understand gears and the principles of gear movement, including how gears change direction and speed during rotation. Students will understand the effects of gear interactions.	**Creativity**
4	**Find the Cycle**	Understand what a cycle is and identify cycles in word problems. Use the relationships between cycle and remainder to solve problems.	**Number (word problem)**
5	**Tree Diagram**	Use tree diagrams to solve problems involving enumeration. Distinguish the difference between the problem starting from "Step 1" and the problem starting from "Step 2".	**Reasoning**
6	**Multiplication Strategies**	Use commutative law and distributive law of multiplication to solve operations quickly and efficiently.	**Number**
7	**Inverse Operation Problems**	Find the original with a known result and calculation steps. Cultivate inverse thinking ability and solve related real-life problems.	**Number (word problem)**
8	**Age Problems**	Understand characterstics including the differences and sums of ages. Convert age problems into sums, differences and multiples problems to better analyze and solve them.	**Number (word problem)**
9	**Rolling the Dice**	According to the characteristics of standard dice, find the pattern of the rolling dice, and then solve problems.	**Creativity**
10	**Understand Decimals**	Understand the meaning of decimals and the relationship between fractions and decimals. Compare decimals according to place values, and solve problems in real life.	**Number**
11	**Magic Line Segment**	Use line segments to visualize the problems with sum, difference, and multiple. Cultivate the ability to understand how to read and solve problems with sum, difference, and multiple, and the ability to turn complex problems into simple graphs.	**Number (word problem)**
12	**Find the Average**	Understand the meaning of average and weighted average. Solve complex problems using the idea of balancing.	**Number (word problem)**
13	**Advanced Operations without Number**	Learn how to solve equations with pictures by adding and subtracting them based on their characteristics. Enhance logical reasoning ability and introduce the basic concept of algebra.	**Reasoning**
14	**Data Analysis in Graphs**	Explore the basic statistical concepts. Learn how to find or calculate the average, mode, median, and range in bar graphs and line graphs. Build an understanding of statistics.	**Measurement and Data**
15	**Division Strategies**	Use "distributive law of division" and property of unchanged quotient to solve operations quickly and efficiently.	**Number**
16	**Addition and Subtraction of Decimals**	Understand the addition and subtraction methods of decimals. Learn how to calculate simple operations mentally, and calculate complex operations with column addition and subtraction. Solve some real-life problems.	**Number**
17	**Strategies of Finding Perimeter**	Calculate the perimeter of irregular shapes by the translation method. Use hands-on method to experience changes in perimeter to solve problems.	**Spatial Sense**
18	**Strategies of Finding Area**	Use methods of splitting and patching to find the area of an irregular shape. Observe the relationships among different parts in an irregular shape and use them to find the area of the shape. Consolidate methods for finding the area, and learn how to solve it quickly.	**Spatial Sense**

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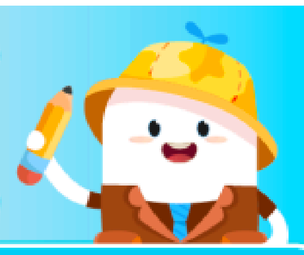
G3 Spring Syllabus H



	Topic	Content	Common Core Standard
1	**Numbers in Base Ten (Million)**	Recognize Place Values of Large Numbers Within One Million Compare Large Numbers Within One Million Solve Multi-Step Addition and Subtraction Word Problems with Large Numbers	**CC4.NBT**
2	**Factors**	Recognize and Find Factors Determine Factors Using Division Find Greatest Common Factor	**CC4.OA**
3	**Prime and Composite Numbers**	Determine Whether a Number is Prime or Composite Prime and Composite Numbers Within 30 Use the Properties of Prime and Composite Numbers for Logical Reasoning	**CC4.OA**
4	**Multiples**	Recognize and Determine Multiples Understand the Relationship Between Factors and Multiples Find Least Common Multiple	**CC4.OA**
5	**Metric Mass and Volume**	Understand and Convert Metric Units of Mass Understand and Convert Metric Units of Volume Solve Word Problems with Metric Unit Conversions for Mass and Volume	**CC4.MD**
6	**Measure Angles**	Understand Degrees Measure Angles Using Protractor Count the Number of Angles	**CC4.MD**
7	**Multi-digit Number Multiplication**	Estimate Multiplication Multiply Multi-Digit Numbers by Two-Digit Numbers Solve Word Problems Involving Multi-Digit Numbers Multiplied by Two-Digit Numbers	**CC4.NBT**
8	**Find Unknown Angles**	Calculate Angle Addition Calculate Angle Subtraction Calculate the Degrees of Unknown Angles in Figures	**CC4.MD**
9	**Area of Composite Figure**	Calculate the Area of Composite Figures by Dividing Calculate the Area of Composite Figures by Filling Find the Area of Composite Figures Cleverly	**CC4.G**
10	**Angles in a Triangle**	Identify the Angle Properties of Isosceles and Equilateral Triangles Understand the Sum of Interior Angles in a Triangle Equals 180 Degrees Calculate the Degrees of Interior Angles in a Triangle	**CC4.G**
11	**Applications of the Lines of Symmetry**	Count Lines of Symmetry Identify Lines of Symmetry in Geometric Shapes Apply Lines of Symmetry in Geometric Shapes	**CC4.G**
12	**Compare Fractions**	Review Comparing Fractions with the Same Denominators or Numerators Compare Fractions Using Fraction Strips Compare Fractions by Finding a Common Denominator	**CC4.NF**
13	**Fractions and Decimals**	Find the Expanded Form of Decimals Convert Fractions to Decimals Convert Decimals to Fractions	**CC4.NF**
14	**Compare Decimals**	Compare Decimals with Same Place Values Compare Decimals with Different Place Values Compare Fractions and Decimals	**CC4.NBT**
15	**Advance Bar Graph**	Read Double Bar Graphs Draw Double Bar Graphs Apply Bar Graphs in Real-Life Problems	**CC4.MD**
16	**Venn Diagram**	Understand Two-Element Venn Diagrams Understand Three-Element Venn Diagrams Solve Word Problems with Venn Diagrams	**CC4.MD**
17	**Use Shapes to Represent the Unknown**	Use Shapes to Explore Their Operational Meanings Find the Unknown Numbers Represented by Shapes Logical Reasoning with Shapes	**CC4.OA**
18	**Repeating Pattern Problems**	Find Repeating Patterns in Number Sequences The Number of Times a Number Appears in a Sequence Explore Repeating Patterns in Calendars	**CC4.OA**

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G3 Spring Syllabus Challenge

	Topic	Content	Module
1	**Number Puzzle with Multiplication**	Review the process of vertical multiplication. Solve number puzzles with one unknown digit, including those that involve carrying. Use last-digit analysis to solve puzzles with two unknowns. Learn to solve complex puzzles using estimation, analysis, and trial and error.	**Number & Operations in Base Ten**
2	**Advanced Multiplication of Decimals**	Master multiplication with decimals and apply it to word problems involving multiples and area.	**Number & Operations in Base Ten**
3	**Inverse Operation Problems**	Learn to use the "train diagram" and working backward method to solve restoration problems, from basic numerical puzzles to complex word problems.	**Operations & Algebraic Thinking**
4	**Tricks for the area of quadrilaterals**	Master using the cut-and-paste method to find the area of quadrilaterals on a grid and other composite shapes. Learn to apply area formulas in reverse to solve more complex problems, including those involving the properties of parallel lines.	**Geometry**
5	**Strategies with Decimals**	Learn techniques for mental calculation in decimal addition, subtraction, and multiplication, and master the application of the distributive property.	**Number & Operations in Base Ten**
6	**Advanced Division of Decimals**	Understand the principle of an invariant quotient to master the calculation method for division problems where the divisor is a decimal.	**Number & Operations in Base Ten**
7	**Finding Patterns**	Master methods for identifying patterns in shapes and number sequences, and apply parity analysis to solve problems.	**Operations & Algebraic Thinking**
8	**Triangles**	Master the classification of triangles by their side and angle properties, and understand the "sum of two sides is greater than the third" property.	**Geometry**
9	**Calculating Angles in Triangles**	Master the Triangle Angle Sum Theorem and apply the unique properties of right, isosceles, and equilateral triangles to perform angle calculations.	**Geometry**
10	**Advanced Word Problems on Multiplication and Division**	Extend the ability to analyze quantitative relationships from integer-based problems to solve multiplication and division word problems involving decimals.	**Operations & Algebraic Thinking**
11	**Prime and Composite Numbers**	Master the key concepts of prime, composite, and relatively prime numbers, with the ability to identify primes within 30.	**Operations & Algebraic Thinking**
12	**Equivalent Fractions**	Develop an intuitive understanding of equivalent fractions through visual models and master the fundamental properties of fractions. Learn to simplify fractions using cancellation.	**Number & Operations - Fractions**
13	**Advanced Word Problems of Time**	Master complex time calculations involving crossing days and time zones.	**Measurement & Data**
14	**Basic Addition and Subtraction of Fractions**	Understand addition and subtraction of fractions and mixed numbers with like denominators, including simplifying results.	**Number & Operations - Fractions**
15	**Advanced Addition and Subtraction of Fractions**	Master the method of finding common denominators to solve addition and subtraction problems with unlike fractions. Cultivate the mathematical concept of transformation and flexible problem-solving skills.	**Number & Operations - Fractions**
16	**Complicated Age Problems**	Utilize the core principle of invariant age difference, combined with diagrammatic analysis, to solve various complex age-related word problems.	**Operations & Algebraic Thinking**
17	**Comparing Fractions and Decimals**	Master the bidirectional conversion between fractions (including mixed numbers) and decimals, applying this to compare magnitudes by flexibly choosing the appropriate form.	**Number & Operations - Fractions**
18	**Inclusion and Exclusion**	Master the use of Venn diagrams to understand the relationships between sets and solve basic inclusion-exclusion problems.	**Operations & Algebraic Thinking**

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G3 Spring Syllabus ACE

	Topic	Content	Module
1	**Triangles**	Recognize triangles, and understand its definition, its classification and its graphic features. Experiment with the proof of the sum of the interior angles of triangles, and apply it to solve angle-related problems.	**Geometry**
2	**Basic Arithmetic Sequence**	Find the general term of an arithmetic sequence and calculate the number of terms in arithmetic sequences.	**Algebra and Sequence**
3	**Inverse Operation Problems**	Master drawing tools and reverse logic to solve inverse operation problems that include multiple computations. Cultivate application awareness.	**Word Problems**
4	**Prime and Composite Numbers**	Understand the concept of factors, multiples, prime and composite numbers. Learn to determine if a number is prime or not. Know a special prime number (2) and its application. Enhance number sense and computation skills.	**Number Theory**
5	**Advanced Addition and Subtraction of Fractions**	Learn to find the common factors and multiples of two numbers by enumeration. Master the method of finding common denominators to solve addition and subtraction problems with unlike fractions. Cultivate the mathematical concept of transformation and flexible problem-solving skills.	**Numbers and Operations**
6	**Distribution Problems**	Applications of division with remainders. Analyze and solve complex distribution problems.	**Word Problems**
7	**Area of a Triangle**	Learn the properties of a triangle and the area formula. Understand how to solve related word problems and build spatial cognition abilities.	**Geometry**
8	**Representing Unknown Numbers**	Learn to use letters in representing numbers, and to simplify algebraic expressions with letters. Represent equality relationships with variables.	**Algebra and Sequence**
9	**Multiplication of Fractions**	Calculate the multiplication of proper fractions, improper fractions, and mixed numbers. Be familiar with basic computation and quick multiplication and raise the speed of multiplication.	**Numbers and Operations**
10	**Division of Fractions**	Calculate the division of proper fractions, improper fractions, and mixed numbers. Be familiar with basic computation and raise the speed of division.	**Numbers and Operations**
11	**Inclusion and Exclusion**	Learn about word problems on inclusion and exclusion and understand the concept of partial overlapping.	**Combinatorics**
12	**Basic Equations**	Recognize simple equations. Discuss the methods to solve the equations. Apply simple equations to solve word problems, and perceive the merits of equation application.	**Algebra and Sequence**
13	**Tricks to Solve the Area**	Review the method of cutting and forming new shapes. Using the formulas of areas of parallelogram, trapezoid, and triangle to solve the area of irregular figures inversely. Learn new tricks to solve the area of different shapes and build spatial cognition abilities.	**Geometry**
14	**Advanced Distance, Speed, and Time**	Review the relationship between speed, time, and distance. Learn how to use uncommon units as distance units, convert composite speed units, and address variable speed problems.	**Word Problems**
15	**Complicated Rule of Sum and Rule of Product**	Apply the rule of sum and product on sequence-related word problems and enhance application awareness.	**Counting, Probability, and Statistics**
16	**Specified Operation**	Solve problems with new operations defined. Observe and interpret math tricks using new operations.	**Numbers and Operations**
17	**Complicated Chicken and Rabbit Problems**	Discuss generalized chicken & rabbit problems by grouping method. Apply the grouping method to solve different types of chicken & rabbit problems.	**Word Problems**
18	**Basic Probability**	Recognize probability and its definition, learn simple probability questions, and enhance data analysis skills.	**Counting, Probability, and Statistics**

G4 Core+ Syllabus

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	Topic	Details	CC 4 Module
Lesson 1	Numbers in Base Ten (Million)	1. Addition and subtraction of integers within one million 2. Word problems with addition and subtraction within one million	Numbers & Operations
Lesson 2	Complex multi-digit division	1. Complex multi-digit division by 1-digit numbers 2. Word problems with multi-digit division	Numbers & Operations
Lesson 3	Arithmetic Sequences	1. Patterns in sequences 2. Finding patterns in simple sequences	Numbers & Operations
Lesson 4	Fun with Translation	1. Understanding Translation 2. Translation Distances	Geometry
Lesson 5	Parallel and Perpendicular	1. Understanding the parallel and perpendicular 2. Identifying parallel and perpendicular lines	Geometry
Lesson 6	Complex Time Addition	1. Complex time addition with carrying 2. Word problems with time addition	Numbers & Operations
Lesson 7	Complex Time Subtraction	1. Complex time subtraction with borrowing 2. Word problems with time subtraction	Numbers & Operations
Lesson 8	Advanced Sum and Multiple Problems	1.Review and enhance the skills of one-digit division. 2.Better understanding the four basic operations by applying them in mixed operations. 3.Apply the skill in solving sum and multiple problems	Word Problems
Lesson 9	Common Multiple Word Problems	Use enumeration skill to find the least common multiple and greatest common factor of two numbers.	Word Problems
Lesson 10	Grids and Shifts	Understand grids, and learn the calculation methods of various shapes on grdis. Learn how to use estimation, cutting, and patching method to find the area of irregular shapes in the grid.	Geometry
Lesson 11	Knowing Square Numbers and Cubic Numbers	1. Multiplying 2-Digit Numbers 2. Knowing Square Numbers and Cubic Numbers 3. Theorem of Middle Term	Numbers & Operations
Lesson 12	Advanced Prime and Composite Numbers	1. Prime and Composite Numbers in 100 2. Forming Prime Numbers	Numbers & Operations
Lesson 13	Prime Factorization	1. Prime Factorization 2. Relationship between Factors and Multiples 3. Applying Factors and Multiples	Numbers & Operations
Lesson 14	Improper Fractions and Mixed Numbers	1. Knowing Improper Fractions and Mixed Numbers 2. Relationship between Improper Fractions and Mixed Numbers 3. Converting Mixed Numbers to Improper Fractions	Numbers & Operations
Lesson 15	Addition of Mixed Numbers	1. Addition of Mixed Numbers 2. Patterns in Arithmetic Sequences	Numbers & Operations
Lesson 16	Subtraction of Mixed Numbers	1. Subtraction of Mixed Numbers 2. Word Problems on Mixed Numbers	Numbers & Operations
Lesson 17	Relationship between Fractions and Decimals	1. Relationship between Fractions and Decimals 2. Outcomes	Numbers & Operations
Lesson 18	Magic of Rotation	1. Rotation 2. Rotation in Clocks 3. Finding Rotation Patterns in Shapes	Geometry

Must-have concepts:

(1) Strengthen in calculation: mixed numbers/fractions/decimals

(2) Key Geometry basics (foundation of middle school): Translation; Rotation; Parallel and Perpendicular

(3)Word Problem: *** important year to solidate understanding & complex calculation

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G4 Spring Syllabus H

	Topic	Content	Common Core Standard
1	**Know Volume**	Know Volume Use Unit Cubes to Measure Volume Count Unit Cubes in Layers to Find Volume	**CC5.MD**
2	**Volume of Rectangular Prisms**	Know the Components of a Rectangular Prism Use Different Formulas to Find Volume of a Rectangular Prism Solve One-Step Real-World Problems of Volume	**CC5.MD**
3	**Multiplication of Fractions**	Fractions Multiplied by Whole Numbers Fractions Multiplied by Fractions Simplify the Multiplication of Fractions	**CC5.NF**
4	**Basic Division of Fractions**	Understand Division of Fractions and Whole Numbers Divide Whole Numbers by Fractions Divide Fractions by Whole Numbers	**CC5.NF**
5	**Advanced Division of Fractions**	Understand Division of Fractions Divide Fractions by Fractions Advanced Word Problem Involving Division of Fractions	**CC6.NS**
6	**Advanced Division of Multi-digit Numbers**	Estimate Quotients Divide a 2-Digit Number by a 2-Digit Number Divide a 3-Digit Number by a 2-Digit Number	**CC5.NBT**
7	**Multiplication of Decimals**	Understand Multiplication of Decimals Long Multiplication of Decimals and Whole Numbers Long Multiplication of Decimals and Decimals	**CC5.NBT**
8	**Basic Division of Decimals**	Divide Whole Numbers to Find the Quotient of a Decimal Divide Decimals by One-Digit Whole Numbers Solve Real-World Problems about Division of Decimals	**CC5.NBT**
9	**Estimation of Decimals**	Estimate Addition and Subtraction of Decimals Estimate Multiplication of Decimals Estimate Division of Decimals	**CC5.NBT**
10	**Basic Whole Number Equation**	Review Letters Represent Unknown Numbers Know the Property of Equations Solve One-Step Equations	**CC6.EE**
11	**Advanced Whole Number Equation**	Know the Like Terms Group the Like Terms Solve Two-Step Equations	**CC6.EE**
12	**Volume of Combined Solid Figures**	Find Volume of Solid Figures Combined by Rectangular Prisms Solve Real-World Problems of Combined Solid Figures Solve Two-Step Real-World Problems of Volume	**CC5.MD**
13	**Advanced Improper Fractions and Mixed Numbers**	Convert Between Improper Fractions and Mixed Numbers Convert Between Division and Fractions Convert Between Mixed Numbers and Decimals	**CC5.NF**
14	**Basic Multiplication and Division of Mixed Numbers**	Understand Multiplication and Division of Mixed Numbers Multiplication and Division of Mixed Numbers and Whole Numbers Multiplication and Division of Mixed Numbers and Fractions	**CC5.NF**
15	**Advanced Multiplication and Division of Mixed Numbers**	Multiplication and Division of Mixed Numbers Estimate Multiplication and Division of Mixed Numbers Know the Property of Multiplication and Division of Mixed Numbers	**CC6.NS**
16	**Line Plot**	Make a Line Plot Interpret a Line Plot Find the Average on a Line Plot	**CC5.MD**
17	**Strategies of Multiplication and Division of Decimals**	Multiply Decimals with Round Numbers Divide Decimals by Round Numbers Group Friendly Numbers of Decimals as a Strategy	**CC5.NBT**
18	**Advanced Division of Decimals**	Decimals Divided by Whole Numbers Divide Decimals with the Same Place Value Divide Decimals with Different Place Value	**CC5.NBT**

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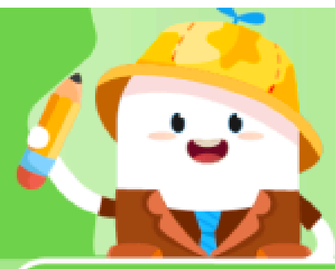
G4 Spring Syllabus

Intro to Challenge/Challenge



	Topic	Content	Module
1	**Calculation Strategies on Fractions, Decimals, and Percentages**	Review the distributive law of multiplication.Understand the inverse application of distribuitive law of multiplication and master the tricks to extract common factors.	**Numbers and Operations**
2	**Basic Circles**	Discuss the history of circles. Introduce the characteristics and other properties of circles. Find the areas and perimeters of circles.	**Geometry**
3	**Properties and Applications of Remainders**	Understand the relationship between dividend, divisor, quotient, and the remainder. Learn the features of remainders. Apply the knowledge of remainders to solve complicated number theory problems.	**Number Theory**
4	**Solving Advanced Word Problems with Equations**	Continue solving more complicated word problems by forming equations ("chickens and rabbits", "profit and loss", etc.).	**Word Problems**
5	**Inductive Recursion**	Find patterns out of figures. Study the Fibonacci Sequence. Apply the recursion of Fibonacci Sequence to complicated problems.	**Combinatorics**
6	**Advanced Circles**	Review the method of calculating circumference and area of a circle. Learn the method of calculating areas of sectors and annulus.	**Geometry**
7	**Perfect Square**	Know perfect squares and learn to calculate perfect squares. Judge whether a number is a perfect square, and apply the number theory knowledge to perfect squares.	**Numbers and Operations**
8	**Fun Traveling Problems**	Discuss a series of topics in train problems and boat problems. In train problems, the traveling object has a length that cannot be neglected and it is passing a bridge or a tunnel. In boat problems, distinguish the traveling speed in the water when going downstream and upstream. Apply these models to solve travel word problems.	**Word Problems**
9	**Basic Cubes and Rectangular Prisms**	Understand cubes and rectangular prisms. Learn the calculation method of surface area and volume, and be able to complete some problems related to surface area and volume.	**Geometry**
10	**Fractional Equations**	Review the basic rules of equations and learn how to solve fractional coefficient equations.	**Algebra and Sequence**
11	**Advanced Arithmetic Sequences**	Review general term formula of arithmetic sequences. Learn how to find the sum and use the sum to find the middle term of an arithmetic sequences. Apply the knowledge of arithmetic sequence to solve problems.	**Algebra and Sequence**
12	**Graphing Distance and Time**	Review the relationship between speed, distance, and time. Analyze the changes in the movement process according to the images and words and solve problems.	**Word Problems**
13	**Advanced Cubes and Rectangular Prisms**	Review the methods for calculating surface area and volume. Cut rectangular prisms and learn how to find the new surface area. Learn how to determine the volume after melting a cube to form a rectangular prism.	**Geometry**
14	**Scale**	Review the conversion between common measurements of length in daily life. Understand the proportional scale and use it to solve a series of problems. Understand the changing relationship between length ratio and area ratio.	**Word Problems**
15	**Equal Altitude Model**	Study the relation between bases and areas of same or equal altitude triangles. Apply interpretation to triangle related problems.	**Geometry**
16	**Advanced Statistical Graphs**	Introduce the key methods for solving questions, such as percentage and angle calculations in pie charts, the line plot related to geometric properties, and the effect of adding or changing a number on the mean, median, and mode. The aim is to enhance skills in data analysis and chart interpretation.	**Counting, Probability, and Statistics**
17	**Pythagorean Theorem**	Learn the history of the Pythagorean Theorem. Understand the meaning of the Pythagorean theorem and the proof method. Memorize the common hook numbers and apply them to geometry problems.	**Geometry**
18	**Congruence Modulo**	Understand the meaning of congruence, learn the properties of congruence, and learn to use the congruence theorem to solve related number theory problems.	**Number Theory**

Syllabus for 5 Core+

2026 Spring

	Topics	Knowledge Points	Common Core
1	**Ratio**	1. Definition of Ratio 2. Writing Ratio 3. Equivalent Ratios	CCSS.6.RP.A.1
2	**Rates**	1. Definition of Rates 2. Unit Rates 3. Rate Word Problems	CCSS.6.RP.A.2
3	**Applying Ratio and Rates**	1. Representing Ratio and Rates 2. Proportion 3. Proportion Word Problems	CCSS.6.RP.A.3.A
4	**Calculation Strategies of Fractions**	1. Complement Method of Fractions 2. Distributive Law of Fractions 3. Extract Common Factors from Fractions	CCSS.6.NS.A.1
5	**Equations**	1. Equations with Whole Numbers 2. Equations with Fractions	CCSS.6.EE.C.9
6	**Converting Measurement Systems**	1. Conversion Factor 2. Conversion within Measurement Systems 3. Converting between Measurement Systems	CCSS.MATH.6.RP.A.3.B
7	**Percents**	1. Definition of Percents 2. Percents, Fractions and Decimals Conversion 3. Fast Calculation of Percents	CCSS.6.RP.A.3.C
8	**Applying Percents**	1. Finding the Percent of a Number 2. Find a Whole or a Part 3. Percent Word Problems	CCSS.6.RP.A.3.C
9	**Mid Term Review**		
10	**Writing and Representing Equations**	1. Definition of Independent and Dependent Variables 2. Table of Independent and Dependent Variables 3. Writing Equations from Table	CCSS.6.EE.C.9
11	**Specified Operation**	1. Comparing Operations 2. Simple Operations Related to the Position 3. Complicated Operations	—
12	**Surface Area of Solid Figures**	1. Nets and Surface Area 2. Surface Area of Prism and Pyramid	CCSS.6.G.A.4
13	**Volume of Cube and Rectangular Prism**	1. Volume of Cubes 2. Volume of Rectangular Prisms	CCSS.6.G.A.2
14	**Volume Word Problems**	1. Equations in Volume Formula 2. Solve Multistep Volume Problems	CCSS.6.G.A.2
15	**Distance and Polygon in the Coordinate Plane**	1. Finding Distance Between Two Points 2. Perimeter of Polygons in the Coordinate Plane 3. Area of Polygons in the Coordinate Plane	CCSS.6.G.A.3
16	**Equation Word Problem**	1. Writing Equations from Description in Word Form. 2. Using Unknown Letter to Represent Objects in Real World Problems. 3. Using Unknown Letter to Make and Solve Equations in Real World Problems.	CCSS.7.EE.B.3
17	**Final Review**		
18	**Road to Pre-algebra**	1. Number System 2. Algebraic Expressions	—

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G5 Spring Syllabus H

	Topic	Content	Common Core Standard
1	**Three Views of Solid Figures**	Identify the Three Views of Solid Figures Restore Solid Figures Based on the Three Views Calculate the Surface Area of Solid Figures Using Three Views	**CC6.G**
2	**Rational Number Operations**	Understand Rational Numbers Add and Subtract Negative Fractions Mixed Operations of Rational Numbers	**CC7.NS**
3	**Dot Plot**	Display Data with Dot Plot Interpret Dot Plot Calculate Mean and Median Using Dot Plot	**CC6.SP**
4	**Divisibility Rules**	Divisibility Rules for 2 and 5 Divisibility Rules for 4 and 25 Divisibility Rules for 3 and 9	**CC6.NS**
5	**Mean Absolute Deviation**	Recognize and Understand Variability Recognize and Calculate Mean Absolute Deviation (MAD) Apply MAD in Combination with Dot Plot	**CC6.SP**
6	**Comprehensive Unit Conversion**	Convert Various Metric Units Convert Various Customary Units Combine Unit Conversion with Geometry	**CC6.RP**
7	**Comprehensive Area of Plane Figures**	Review the Area of Common Plane Figures Calculate the Area of Rhombus Relationship Between Change in Side Length and Area	**CC6.G**
8	**Area of Composite Figures**	Calculate the Area of Irregular Figures by Division Method Calculate the Area of Irregular Figures by Completion Method Calculate the Area of Irregular Figures by Translation Method	**CC6.G**
9	**Squares and Square Roots**	Characteristics of Perfect Squares Calculate the Square Root Application of Squares in Area Calculation	**CC7.NS**
10	**Inequalities**	Recognize the Four Types of Inequality Relationships Represent Inequalities on the Number Line Solve Inequalities	**CC6.EE**
11	**Distance-Time Graphs**	Recognize Distance-Time Graphs Match Distance-Time Graphs According to Descriptions Compare Speeds Using Distance-Time Graphs	**CC6.SP**
12	**Distance on the Coordinate Plane**	Distance Between Points with the Same Horizontal Coordinate Distance Between Points with the Same Vertical Coordinate Calculate the Distance Between Points to Solve Real-World Problems	**CC6.NS**
13	**Shapes on the Coordinate Plane**	Mark Points on the Coordinate Plane to Form Figures Calculate the Perimeter of Figures on the Coordinate Plane Calculate the Area of Figures on the Coordinate Plane	**CC6.G**
14	**Histograms**	Display Data with Histogram Determine and Select Appropriate Intervals Interpret Histogram	**CC6.SP**
15	**Multiplication and Division of Negative Integers**	Multiply Negative Numbers Divide Negative Numbers Mixed Operations with Positive and Negative Integers	**CC7.NS**
16	**Advanced Exponent Operations**	Review Powers with Positive Bases Calculate Powers with Negative Bases Multiplication and Division of Powers	**CC7.EE**
17	**Final Review 1**	Comprehensive Calculation Exercises Ratio and Proportion Exercises Plane and Solid Geometry Exercises	**CC6**
18	**Final Review 2**	Algebraic Expressions and Equations Exercises Statistics and Probability Exercises Unit Conversion Exercises	**CC6**

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G5 Spring Syllabus

Pre Algebra Accelerated

	Topic	Content	Module
1	**Integrated Angles**	Review fundamental angle theorems and calculate angles within complex geometric diagrams. Master solving triangle exterior angle problems through practical applications.	**Geometry**
2	**Triangles, Quadrilaterals, and Circles**	Solve advanced area problems involving parallelograms, triangles and the Pythagorean theorem. Explore circle-based figures and analyze polygon rolling motion paths.	**Geometry**
3	**Advanced Efficiency Word Problems**	Apply the relationship between workload, work time, and work efficiency to solve real-world problems. Learn to use equations to solve efficiency word problems. Master using equations to solve complex inflow and outflow problems.	**Word Problems**
4	**System of Linear Equations**	Understand systems of linear equations and express variables algebraically. Apply substitution and elimination methods to solve problems.	**Algebra and Sequence**
5	**Real Numbers**	Master mixed operations with radicals including cube roots, and establish fundamental understanding of real number classification. Perform complex multi-step calculations integrating absolute values, exponents, and nested radicals.	**Numbers and Operations**
6	**Algebraic Expressions**	Build foundational knowledge of algebraic terminology and standardized notation conventions. Identify monomial/polynomial structures and develop systematic simplification techniques.	**Algebra and Sequence**
7	**Addition and Subtraction of Polynomials**	Recognize like terms patterns and consolidate combination strategies. Synthesize distributive property applications with advanced expression simplification.	**Algebra and Sequence**
8	**Multiplying and Dividing Polynomials**	Execute monomial-based multiplication and division operations fluently. Master binomial multiplication through pattern recognition and FOIL method applications.	**Algebra and Sequence**
9	**Operation Properties of Inequalities**	Represent inequalities on number lines and master fundamental properties through operations. Apply inequality solving techniques to real-world scenario word problems.	**Algebra and Sequence**
10	**Integrated Exponents**	Strengthen exponential computation skills including negative exponents. Master scientific notation applications with negative bases and exponents through guided practice.	**Numbers and Operations**
11	**More about Solid Figures**	Learn the concepts of prisms, pyramids, and spheres, as well as their surface area and volume formulas.	**Geometry**
12	**Immersing Objects in the Water**	Review the volume formula of cubes, rectangular prisms, and cylinders. Learn about immersing objects in water (whole, half, overflowing), and be able to solve particular types of real-world problems.	**Geometry**
13	**Congruent and Similar Figures**	Understand the definitions and properties of congruent and similar figures, and apply them in simple cases. Learn the "Angle-Angle Similarity" criterion for similar triangles and become familiar with the process of proving geometric problems.	**Geometry**
14	**Coordinate Plane and Functions**	Calculate point-to-axis distances and map coordinate relationships. Graph functions efficiently and verify solution points on coordinate planes.	**Algebra and Sequence**
15	**Linear Equations I**	Define direct proportion relationships and graph proportional functions. Compare multiple proportional functions visually in shared coordinate systems.	**Algebra and Sequence**
16	**Linear Equations II**	Graph linear functions in standard form and determine slope using coordinate points. Analyze intercepts and identify axis intersection points systematically.	**Algebra and Sequence**
17	**Linear Equations III**	Derive linear equations using multiple point configurations. Investigate function intersections, parallelism, and quadrant characteristics.	**Algebra and Sequence**
18	**Transformations in Coordinate Plane**	Execute translations and symmetry transformations on geometric figures. Master rotational coordinate changes and function re-expression techniques.	**Geometry**

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Syllabus for Pre-Algebra

2026 Spring Honors

	Topic	Knowledge Point	Common Core
1	**Polynomials Enhancement**	1. Adding and Subtracting of Polynomials 2. Multiplying Polynomials by a Monomial 3. Multiplying Binomials 4. Dividing Polynomials by a Monomial	8.EE.A
2	**Inequalities**	1. Plotting Inequalities 2. Sloving Inequalities 3. Inequalities word problem	6.EE.B.5
3	**System of Linear Equations**	1. Indeterminate Equations 2. Testing Solutions 3. Substitute Elimination Method 4. Subtraction Elimination Method	8.EE.C.8
4	**Relation and Function**	1. Relation and function 2. Evaluating Function 3. Graph of Function	7.RP.A.2
5	**Linear Function Part 1: Direct Variation**	1. Slope 2. Definition and Graph of Direct Variation 3. Properties of Direct Variation	8.F.A.1
6	**Linear Function Part 2: Definition and Graph**	1. Function Form 2. Definition and Graph of Linear Equations 3. Slope and Intercept of Linear Equations 4. Slope Intercept Form	8.F.A.2
7	**Linear Function Part 3: Writing Linear Equations**	1. Writing Linear Equations 2. Properties of Linear Equations	8.F.A.3
8	**Cube, Prism, Pyramid**	1. The Surface Area and Volume of Cubes 2. The Surface Area and Volume of Prisms 3. The Surface Area and Volume of Pyramids	7.G.B.6
9	**Cylinder, Cone and Sphere**	1. The Surface Area and Volume of Cylinders 2. The Slant Height and Volume of Cones 3. The Volume of Spheres	8.G.C.9
10	**The Distance and Midpoint Formulas**	1. The Distance Formula 2. Distance in Geometric FIgure 3. The Midpoint Formula 4. Word Problems	8.G.B.8
11	**Special Triangles**	1. 45-45-90 and 30-60-90 Triangles 2. The Area of Equilateral Triangles 3. The Sine, Cosine and Tangent Ratios in a Triangle	HSG.SRT.6 HSG.SRT.8
12	**Elementary Satatisitics**	1. Measure of Variation 2. Dot Plot & Box Plot 3. Histogram	7.SP.B.4
13	**Population and Samples**	1. Population and Samples 2. Random Sample and Biased Samples 3. Making Inference from Samples	7.SP.A.1
14	**Composite and Prime Factorization**	1. Factors 2. Prime Factorization 3. GCF & LCM	6.NS.B.2-4
15	**Addition and Multiplication Principles**	1. Addition and Multiplication Principles 2. Factorial	7.SP.C.8
16	**Probability**	1. Definition of Probability 2. Finding Probability 3. Experimental Probability	7.SP.C.5
17	**Theoretical Probability**	1. Theoretical Probability 2. Two-way Table 3. Probability of Compound Events	7.SP.C.7
18	**Linear Equations Enhancement**	1. Equations and Graphs of Direct Variations 2. Equations and Graphs of Linear Equations	8.F.A.1-3

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Syllabus for Pre-Algebra

2026 Spring Challenge

	Topic	Knowledge Point
1	**Tackle AMC 8 AR: Mean, Median and Mode**	1. Definition of Mean, Median and Mode 2. Word Problems of Mean, Median and Mode in AMC 8
2	**Monomials and Polynomials**	1. Review of Algebraic Expressions 2. Monomial Definition 3. Polynomial Definition
3	**Adding and Subtracting Polynomials**	1. Ascending and Descending Order 2. Adding Polynomials 3. Subtracting Polynomials
4	**Inequalities**	1. Plotting Inequalities 2. Sloving Inequalities 3. Inequalities word problem
5	**System of Linear Equations**	1. Indeterminate Equations 2. Testing Solutions 3. Substitute Elimination Method 4. Subtraction Elimination Method
6	**Relation and Function**	1. Relation and Function 2. Evaluating Function 3. Graph of Function
7	**Linear Equation Part 1: Direct Variation**	1. Slope 2. Definition and Graph of Direct Variation 3. Properties of Direct Variation
8	**Linear Equation Part 2: Definition and Graph**	1. Function Form 2. Definition and Graph of Linear Equations 3. Slope and Intercept of Linear Equations 4. Graph of Linear Function
9	**Linear Equation Part 3: Writing Linear Equations**	1. Slope Intercept Form 2. Writing Linear Equations 3. Properties of Linear Equations
10	**Cube, Prism, Pyramid**	1. The Surface Area and Volume of Cubes 2. The Surface Area and Volume of Prisms 3. The Surface Area and Volume of Pyramids
11	**Cylinder, Cone and Sphere**	1. The Surface Area and Volume of Cylinders 2. The Surface Area and Volume of Cones 3. The Volume of Spheres
12	**The Distance and Midpoint Formulas**	1. The Distance Formula 2. Distance in Geometric Figure 3. The Midpoint Formula 4. Word Problems
13	**Special Triangles and Trigonometric Ratios**	1. 45-45-90 and 30-60-90 Triangles 2. The Sine, Cosine and Tangent Ratios in a Triangle
14	**Permutation and Combination**	1. Permutation 2. Combination 3. Casework
15	**Applying Probability**	1. Addition and Multiplication of Probability 2. Permutation, Combination and Probability 3. Geometric Probability
16	**Geometric Sequences**	1. Identify Geometric Sequences and the Common Ratio 2. The Rule of Geometric Sequences
17	**Multiplying and Dividing Monomials and Polynomials**	1. FOIL 2. Multiplying Binomials
18	**Linear Equations Enhancement**	1. Equations and Graphs of Direct Variations 2. Equations and Graphs of Linear Equations

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Syllabus for Algebra 1

2026 Spring Honors

	Topic	Knowledge Point	Common Core
1	**Piecewise-Defined Function**	1. Writing Piecewise-Defined Functions with Function Notation 2. Finding Domain and Range 3. Evaluating and Graphing Piecewise-Defined Functions	HSF.IF.A.1-2 HSF.IF.B.4-5
2	**Linear Equations Enhancement**	1. Basics and Properties of Linear Equations 2. Advanced Transformation of Linear Equations 3. Application of Linear Equations	8.F.B.4-5 HSF.IF.B.4
3	**Exponential Functions I**	1. Definition of Exponential Functions 2. Writing and Graphing Exponential Growth Functions 3. Comparing the Graphs of Exponential Growth Functions 4. Modeling with Exponential Growth Functions	HSF.LE.A.1-A.4 HSF.LE.B.5
4	**Exponential Functions II**	1. Writing and Graphing Exponential Decay Functions 2. Comparing the Graphs of Exponential Decay Functions 3. Modeling with Exponential Decay Functions	HSF.LE.A.1-A.4 HSF.LE.B.5
5	**Rational Expressions I**	1. Simplifying Rational Expressions 2. Multiplying and Dividing Rational Expressions	HSA.APR.A.1 HSA.APR.D.7
6	**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
7	**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
8	**Inverse Variation**	1. Direct Proportional and Inverse Proportional Relationships 2. Graph of Inverse Variation 3. Equations of Inverse Variation 4. Word Problems	HSA.CED.A.2
9	**Quadratic Equations I**	1. Solving Quadratic Equations by Finding Square Roots 2. Solving Quadratic Equations by Perfect Square Pattern 3. Solving Quadratic Equations by Cross Method	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	HSA.REI.B.4
11	**Quadratic Functions I**	1. Definition of Quadratic Functions 2. Graphing Quadratic Functions 3. Properties of Quadratic Functions	HSF.LE.A.1-A.4 HSF.LE.B.5
12	**Quadratic Functions II**	1. Vertex Form of Quadratic Functions 2. Intercept Form of Quadratic Functions 3. Transformation of Quadratic Functions	HSF.LE.A.1-A.4 HSF.LE.B.5 HSA.REI.D.10
13	**Quadratic Functions III**	1. Solving Quadratic Equations by Graphing 2. Modeling with Quadratic Functions	HSF.LE.A.1-A.4 HSF.LE.B.5 HSA.REI.D.10
14	**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
15	**Complex Numbers**	1. Definition of Imaginary Numbers 2. Solving Radicals with Negative Radicants 3. Definition of Complex Numbers 4. Adding and Subtracting of Complex Numbers	HSN.CN.A.1-2 HSN.CN.B.5
16	**Basics of Statistics**	1. Dot Plots and Box Plots 2. Scatter Plots and Correlation 3. The Best-Fit Line	HSS.ID.A.1 HSS.ID.B.6
17	**Arithmetic and Geometric Sequences**	1. Identify Arithmetic Sequences and the Common Difference 2. Identify Geometric Sequences and the Common Ratio 3. Recursive and Explicit Formulas of Arithmetic Sequences 4. Recursive and Explicit Formulas of Geometric Sequences	HSF.LE.A.2
18	**Quadratic Function Enhancement**	1. Properties of Quadratic Functions 2. Different Forms of Quadratic Functions 3. Applications of Quadratic Functions	HSF.LE.A.1-A.4 HSF.LE.B.5 HSA.REI.D.10

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Syllabus for Intro to Geometry

2026 Spring

	Topic	Knowledge Point	Common Core
1	**Linear Equations Enhancement**	1. Basics and Properties of Linear Equations 2. Advanced Transformation of Linear Equations 3. Application of Linear Equations	8.F.B.4-5 HSF.IF.B.4
2	**Piecewise-Defined Function**	1. Writing Piecewise-Defined Functions with Function Notation 2. Finding Domain and Range 3. Evaluating and Graphing Piecewise-Defined Functions	HSF.IF.A.1-2 HSF.IF.B.4-5
3	**Quadratic Functions I**	1. Definition of Quadratic Functions 2. Graphing Quadratic Functions 3. Properties of Quadratic Functions 4. Solving Quadratic Equations by Graphing	HSF.LE.A.1-A.4 HSF.LE.B.5
4	**Quadratic Functions II**	1. Vertex Form of Quadratic Functions 2. Intercept Form of Quadratic Functions 3. Transformation of Quadratic Functions	HSF.LE.A.1-A.4 HSF.LE.B.5 HSA.REI.D.10
5	**Quadratic Functions III**	1. Solve Quadratic Inequalities 2. Modeling with Quadratic Functions	HSF.LE.A.1-A.4 HSF.LE.B.5 HSA.REI.D.10
6	**Exponential Functions I**	1. Definition of Exponential Functions 2. Writing and Graphing Exponential Growth Functions 3. Comparing the Graphs of Exponential Growth Functions 4. Modeling with Exponential Growth Functions	HSF.LE.A.1-A.4 HSF.LE.B.5
7	**Exponential Functions II**	1. Writing and Graphing Exponential Decay Functions 2. Comparing the Graphs of Exponential Decay Functions 3. Modeling with Exponential Decay Functions	HSF.LE.A.1-A.4 HSF.LE.B.5
8	**Complex Numbers**	1. Definition of Imaginary Numbers 2. Solving Radicals with Negative Radicants 3. Definition of Complex Numbers 4. Adding and Subtracting of Complex Numbers	HSN.CN.A.1-2 HSN.CN.B.5
9	**Complex Solutions of Quadratic Equations**	1. Review on the Methods of Solving Quadratic Equations 2. Solving Quadratic Equations with Complex Numbers	HSN.CN.C.7-8
10	**Arithmetic and Geometric Sequences**	1. Identify Arithmetic Sequences and the Common Difference 2. Identify Geometric Sequences and the Common Ratio 3. Recursive and Explicit Formulas of Arithmetic Sequences 4. Recursive and Explicit Formulas of Geometric Sequences	HSF.LE.A.2
11	**Definition and Representation of Sets**	1. Definition of Sets 2. Representation of Sets	
12	**Relation and Operation of Sets**	1. Relation of Sets 2. Operations of Sets	
13	**Statistics**	1. Dot Plots and Box Plots 2. Scatter Plots and Correlation 3. The Best-Fit Line	HSS.ID.A.1 HSS.ID.B.6
14	**Essentials of Geometry**	1. Points, Lines and Planes 2. Segments and Rays and Distance 3. Angles	HSG.CO.A.1
15	**Deductive Reasoning**	1. Reason Use Properties from Algebra 2. Proving Theorems	HSG.CO.C.9
16	**Theorems about Angles and Perpendicular Lines**	1. Special Pairs of Angles 2. Perpendicular Lines 3. Planning a Proof	HSG.CO.A.1
17	**Applications of Linear Equations**	1. The Area of Triangles in Linear Equations 2. Determine the Linear Equation with Given Area of the Triangle 3. Determine the Linear Equation with the Ratio of the Triangles	HSA.REI.D.12
18	**Properties of Proportion, Similar Polygons**	1. Review of Ratio and Proportion 2. Properties of Proportion 3. Similar Polygons	HSG.SRT.B.5

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Syllabus for Geometry

2026 Spring Honors

	Topic	Knowledge Point
1	**Angles in Circles - Part 1**	1. Central Angles 2. Inscribed Angles
2	**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
3	**Power of a Point**	1. Intersecting Chords Theorem 2. Tangent-Secant Theorem 3. Intersecting Secants Theorem
4	**Angles in Circles - Part 2**	1.Cyclic Quadrilateral 2. Other Angles
5	**Prisms and Pyramids**	1. Prisms 2. Pyramids
6	**Cylinders and Cones**	1. Cylinders 2. Cones
7	**Similar Solids and Spheres**	1. Similar Solids 2. Spheres
8	**Transformations-Part 1**	1. Mapping and Functions 2. Reflections
9	**Transformations-Part 2**	1. Translation 2. Rotation 3. Dilation
10	**Composition**	1. Composite of Mappings 2. Inverses and the Identity
11	**Coordinate Proofs**	1. Organizing Coordinate Proofs 2. Coordinate Proofs
12	**Equation of a Circle and Equations of Parabolas**	1. Equation of a Circle 2. Equations of Parabolas
13	**Permutation and Combination**	1. Definition of Permutations and Combinations 2. Methods of Permutations and Combinations
14	**Probability-Part 1**	1. Sample Spaces 2. Venn Diagrams 3. Addition Rule
15	**Probability-Part 2**	1. Conditional Probability 2. Multiplication Rule

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Syllabus for Algebra 2

2026 Spring

	Topic	Knowledge Point	Common Core
1	**Definition and Representation of Sets**	1. Definition of Sets 2. Representation of Sets	
2	**Relation and Operation of Sets**	1. Relation of Sets 2. Operations of Sets	
3	**Absolute Equations and Inequalities**	1. Simplifying the Absolute Values 2. Solving Absolute Equations 3. Solve Complicated Absolute-Value Equations 4. Solving an Absolute-Value Inequalities 5. Solve Complicated Absolute-Value Inequalities	HSA.REI.3
4	**Piecewise-Defined Functions**	1. Graphing Piecewise-Defined Functions 2. Applications of Piecewise-Defined Functions 3. Step Functions & Greatest Integer Function 4. Absolute Value Function 5. Transformations of Absolute Value Parent Functions	
5	**Matrix Operations and Solving Equations**	1. Introduction to Matrices 2. Matrix Operations 3. Multiplying Matrices 4. Inverse Matrices 5. Determinants and Cramer's Rule	HSN.VM.6-12
6	**Arithmetic Sequences & Geometric Sequences**	1. Definition and General Formula of Arithmetic Sequences 2. Arithmetic Series 3. Sigma Notation 4. Definition and General Formula of Geometric Sequences 5. Geometric Series	HSF.LE.2
7	**Complex Numbers**	1. Definition of Imaginary Numbers and Complex Numbers 2. Operations with Complex Numbers and the Conjugate 3. Complex Plane 4. Factoring Complex Numbers	HSN.CN.1-6
8	**Quadratic Equations - Complex number involved**	1. Computing the Square Roots (Complex Numbers Involved) 2. Completing the Square (Complex Numbers Involved) 3. Solving Quadratic Equations by the Quadratic Formula (Complex Number Involved) 4. Vieta's Formula	HSN.CN.7-9 HSA.REI.4
9	**Polynomial Functions-Part 1**	1. Definition of Polynomial Functions and Standard Form 2. Operation of Polynomials 3. Review of Factoring Polynomials	HSF.IF.7-9 HSF.BF.1-4
10	**Polynomial Functions-Part 2**	1. Roots of Polynomial Functions 2. End Behavior of Polynomial Functions 3. Local Maximum & Minimum and Turning Points 4. Solve Polynomial Inequalities	HSF.IF.7-9 HSF.BF.1-4
11	**Operations and Properties of Functions**	1. Function Operations 2. Composition of Functions 3. Inverse Functions 4. Even and Odd Functions	HSF.IF.7.e HSF.IF.8.b HSF.LE.1-5
12	**Exponential Functions**	1. The Definition and Properties of Exponential Functions 2. Translations of Exponential Functions 3. Reflections of Exponential Functions	HSF.IF.7.e
13	**Logarithms**	1. Definition of Logarithms 2. Properties of Logarithms 3. Conversion between Exponent and Logarithm 4. Change of Base Formula	HSF.IF.7.e
14	**Logarithmic Functions**	1. Definition of Logarithmic Functions 2. The Graphs of Logarithmic Functions 3. Properties of Logarithmic Functions	
15	**Exponential and Logarithm Equations**	1. Exponential Equations 2. Solve Logarithmic Equations 3. Solve Exponential and Logarithmic Inequalities	

Syllabus for AMC10 Introduction

2026 Spring

	Topic	Concepts
1	**Calculation Methods**	1. Grouping 2. Telescoping 3. Splitting 4. Substitution 5. Negative Exponent 6. Fractional Exponent
2	**Divisibility**	1. Divisibility Rules 2. Odd numbers and Even numbers 3. Divisibility and Counting
3	**Greatest Common Factor and Least Common Multiple**	1. GCF and LCM 2. Short Division Method 3. AMC 10 Comprehensive Problems
4	**Equations and System of Equations**	1. Solving Systems of Linear Equations 2. Linear Systems in Three Variables 3. Special Techniques
5	**Inequalities**	1. Properties of Inequalities 2. Solving Systematic and Complicated Inequalities
6	**Advanced Equations of Linear Functions**	1. Points on Linear Equations 2. Slope-Intercept Form and Point-Slope Form 3. AMC Problems
7	**Transformations and applications of Equations of Linear Functions**	1. Translation and Symmetry 2. Perpendicular Lines 3. Symmetry about Any Line 4. Rotation about the Origin 5. The Area of Triangles in Linear Equations
8	**Polynomial Multiplication Formulae**	1. Difference of Squares and Perfect Square Formula 2. Perfect Square on Multiple Variables 3. Cubic Formulae and Pascal's Triangle
9	**Factorization**	1. Factoring by GCF 2. Factoring by Special Products 3. Factoring Complicated Polynomials 4. Factoring by Cross Method 5. Use different Method to Factor Complicated Polynomials

	Topic	Concepts
10	**Advanced Prime and Composite Numbers**	1. Determination of prime numbers 2. Perfect Suqares 3. Perfect Cubes
11	**Place Value and Congruence**	1. Place Value 2. Number Bases 3. Basics of Congruence
12	**Quadratic Equations**	1. Solving Quadratic Equations by Finding Square Roots 2. Solving Quadratic Equations in Factored Form 3. Completing the Square 4. Solving Quadratic Equations by the Quadratic Formula 5. Sums and Products of Roots of Quadratic Equations
13	**Rational Expressions**	1. Simplifying Rational Expressions 2. Multiplying and Dividing Rational Expressions 3. Adding and Subtracting with Like Denominators 4. Adding and Subtracting with Unlike Denominators
14	**Rational Equations**	1. Cross Multiply 2. Multiply by the LCD 3. Factor First, then Multiply by the LCD 4. Word Problems
15	**Complicated Absolute-Value Equations and Inequalities**	1. Solving Absolute-Value Equations 2. Solving Absolute-Value Quadratic Equations 3. Solving Absolute-Value Inequalities
16	**Quadratic Functions**	1. Definition of Quadratic Functions 2. Graphing Quadratic Functions 3. Properties of Quadratic Functions 4. Different Forms of Equations 5. Solve Quadratic Inequalities 6. Word Problems
17	**Counting Principle**	1. Addition and Multiplication Principles 2. Inclusive-Exclusive Principles 3. Pigeonhole Principle
18	**Permutation and Combination**	1. Enumeration Methods 2. Binding Methods 3. Filling in the Blanks Method 4. Stars and Bars Method

Syllabus for AMC10 AIME Camp

2026 Spring

	Topic	Concepts
1	**Exponents and Expressions**	1. Techniques for Solving Exponent Problems 2. Construct the Squares Formula 3. Substitution Method in Rational Equations 4. Casework of the Absolute Value
2	**Factorization of Polynomials**	1. Factoring by GCF 2. Factoring by Special Patterns 3. Factoring by Cross Method 4. Factoring by Grouping 5. Factoring by Completing Squares 6. Simon's Favorite Factoring Trick
3	**Sequences(I)**	1. Applications of Arithmetic Sequences 2. The Sum of Geometric Series 2. Applications of Geometric Sequences
4	**Sequences(II)**	1. Comprehensive Application of Arithmetic and Geometric Sequence 2. Recursive Sequence
5	**Triangles**	1. Pythagorean Theorem 2. Properties of Special Triangles 3. Triangle Inequalities
6	**Congruence Triangles**	1. Properties of Angle Bisectors 2. Equal Altitude Models 3. "K" Models 4. Constructing Congruence Techniques
7	**Similar Triangles**	1. Similar Triangles: 'A' and '8' Models 2. Similar Triangles in Quadrilaterals
8	**Regular Polygon**	1. Constructing Right Triangles 2. Chordal Graph 3. Folding Problems 4. Regular Polygons
9	**Circle**	1. Theorems of Chords 2. Position of Points with respect to a Circle 3. Position of Lines with respect to a Circle

	Topic	Concepts
10	**The Properties of Integers**	1. Place Values 2. Properties of Divisibilities 3. Divisibility Rules
11	**Prime Factorizations**	1. Prime Factorization 2. The Total Number of Factors of a Natural Number 3. The Number of Even and Odd Factors 4. Relationships of GCF and LCM
12	**Factors and Multiples**	1. The Sum of Factors 2. Casework in GCF and LCM 3. The Properties of Square Numbers
13	**Modular Arithmetic (I)**	1. Modulo and Congruence 2. Addition and Subtraction 3. Multiplication and Exponentiation 4. Remainder Problems
14	**Modular Arithmetic (II)**	1. Properties of Congruence Modulo 2. Congruence and Sequence Problems 3. Fermat's Little Theorem 4. Divide by the Remainder of 9
15	**Counting (I)**	1. Addition and Multiplication Principles 2. Inclusive-Exclusive Principles 3. Pigeonhole Principle
16	**Counting (II)**	1. Lexicographic ordering 2. Tree Diagram
17	**Combinatorics**	1. Sports Competition 2. Logical Reasoning
18	**Classical Probabilities**	1. Classical Probabilities 2. Complementary Events 3. Dice Problems 4. Counting and Probabilities

Syllabus for Precalculus

2026 Spring

	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