Imagine Math

2018–2019 School Year

North Carolina Mathematics Standard Course of Study Pathways

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Grade 3

NC Mathematics Standard Course of Study

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Number and Operations in Base Ten	1. Visualizing Whole Numbers	Not applicable	
	2. Visualizing Place Value	Not applicable	
Operations and Algebraic Thinking	3. Visualizing Addition	Not applicable	
	4. Visualizing Subtraction	Not applicable	
	5. Structuring Within 5 and Composing 10	NC.1.OA.3	Apply the commutative and associative properties as strategies for solving addition problems.
	6. Structuring Within 10	NC.1.OA.3	Apply the commutative and associative properties as strategies for solving addition problems.
		NC.1.OA.6.i	Add and subtract, within 20, using strategies such as: • counting on
		NC.1.OA.6.ii	Add and subtract, within 20, using strategies such as: • making ten
		NC.2.OA.3.ii	Determine whether a group of objects, within 20, has an odd or even number of members by: • determining whether objects can be placed into two equal groups.
		NC.2.OA.3.i	Determine whether a group of objects, within 20, has an odd or even number of members by: • pairing objects, then counting them by 2s.
	7. Structuring Within 20	NC.1.OA.6.i	Add and subtract, within 20, using strategies such as: • counting on
		NC.1.OA.6.ii	Add and subtract, within 20, using strategies such as: • making ten
		NC.1.OA.6.vi	Add and subtract, within 20, using strategies such as: • creating equivalent but simpler or known sums
		NC.2.OA.2	Demonstrate fluency with addition and subtraction, within 20, using mental strategies.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Number and Operations in Base Ten	8. Structuring Within 100	NC.2.NBT.5.iii	Demonstrate fluency with addition and subtraction, within 100, by: • selecting an appropriate strategy in order to efficiently compute sums and differences.
		NC.2.NBT.5.i	Demonstrate fluency with addition and subtraction, within 100, by: • flexibly using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

		NC.2.OA.1.ii	Represent and solve addition and subtraction word problems, within 100, with unknowns in all positions, by using representations and equations with a symbol for the unknown number to represent the problem, when solving:
			• Two-Step problems involving single digits:
			  ○ Add to/Take from- Change Unknown
			  ○ Add to/Take From- Result Unknown

		NC.2.OA.1.i	Represent and solve addition and subtraction word problems, within 100, with unknowns in all positions, by using representations and equations with a symbol for the unknown number to represent the problem, when solving:
			• One-Step problems:
			  ○ Add to/Take from-Start Unknown
			  ○ Compare-Bigger Unknown
			  ○ Compare-Smaller Unknown

	9. Structuring Within 1,000	NC.2.NBT.7.ii	Add and subtract, within 1,000, relating the strategy to a written method, using: • strategies based on place value
		NC.2.NBT.7.i	Add and subtract, within 1,000, relating the strategy to a written method, using: • concrete models or drawings.
		NC.2.NBT.7.iii	Add and subtract, within 1,000, relating the strategy to a written method, using: • properties of operations.
		NC.3.NBT.2.iii	Add and subtract whole numbers up to and including 1,000. • Use expanded form to decompose numbers and then find sums and differences.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Operations and Algebraic Thinking	10. Concept of Multiplication - Grouping 11. Concept of Multiplication - Word Problems	NC.3.OA.1.i	For products of whole numbers with two factors up to and including 10: • Interpret the factors as representing the number of equal groups and the number of objects in each group.
	12. Concept of Multiplication - Arrays 13. Properties of Addition and Multiplication	NC.3.OA.1.ii	For products of whole numbers with two factors up to and including 10: • Illustrate and explain strategies including arrays, repeated addition, decomposing a factor, and applying the commutative and associative properties.
	14. Concept of Division	NC.3.OA.2.i	For whole-number quotients of whole numbers with a one-digit divisor and a one-digit quotient: • Interpret the divisor and quotient in a division equation as representing the number of equal groups and the number of objects in each group.
	15. Interpreting Division Problems 16. Constructing Division Problems	NC.3.OA.2.i	For whole-number quotients of whole numbers with a one-digit divisor and a one-digit quotient: • Interpret the divisor and quotient in a division equation as representing the number of equal groups and the number of objects in each group.
		NC.3.OA.2.ii	For whole-number quotients of whole numbers with a one-digit divisor and a one-digit quotient: • Illustrate and explain strategies including arrays, repeated addition or subtraction, and decomposing a factor.
	17. Relationship Between Multiplication and Division 18. Multiplication and Division Fact Families	NC.3.OA.7.ii	Demonstrate fluency with multiplication and division with factors, quotients and divisors up to and including 10. • Illustrate and explain using the relationship between multiplication and division.
		NC.3.OA.7.iii	Demonstrate fluency with multiplication and division with factors, quotients and divisors up to and including 10. • Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
		NC.3.OA.6	Solve an unknown-factor problem, by using division strategies and/or changing it to a multiplication problem.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
	19. Solving Multiplication and Division Equations	NC.3.OA.3.i	Represent, interpret, and solve one-step problems involving multiplication and division. • Solve multiplication word problems with factors up to and including 10. Represent the problem using arrays, pictures, and/or equations with a symbol for the unknown number to represent the problem.
		NC.3.OA.3.ii	Represent, interpret, and solve one-step problems involving multiplication and division. • Solve division word problems with a divisor and quotient up to and including 10. Represent the problem using arrays, pictures, repeated subtraction and/or equations with a symbol for the unknown number to represent the problem.
		NC.3.OA.6	Solve an unknown-factor problem, by using division strategies and/or changing it to a multiplication problem.
	20. Division as an Unknown-Factor Problem	NC.3.OA.3.ii	Represent, interpret, and solve one-step problems involving multiplication and division. • Solve division word problems with a divisor and quotient up to and including 10. Represent the problem using arrays, pictures, repeated subtraction and/or equations with a symbol for the unknown number to represent the problem.
		NC.3.OA.6	Solve an unknown-factor problem, by using division strategies and/or changing it to a multiplication problem.
	21. Multiplication and Division Word Problems - Visual Models 22. Multiplication and Division Word Problems - Equations 23. Multiplication and Division Word Problems - Solutions	NC.3.OA.3.i	Represent, interpret, and solve one-step problems involving multiplication and division. • Solve multiplication word problems with factors up to and including 10. Represent the problem using arrays, pictures, and/or equations with a symbol for the unknown number to represent the problem.
		NC.3.OA.3.ii	Represent, interpret, and solve one-step problems involving multiplication and division. • Solve division word problems with a divisor and quotient up to and including 10. Represent the problem using arrays, pictures, repeated subtraction and/or equations with a symbol for the unknown number to represent the problem.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Number and Operations in Base Ten	24. Multiplying by Multiples of Ten	NC.3.NBT.3	Use concrete and pictorial models, based on place value and the properties of operations, to find the product of a one-digit whole number by a multiple of 10 in the range 10–90.
	25. Reasoning About Place Value and Rounding 26. Rounding to the Nearest Ten and Hundred	NC.3.NBT.2.i	Add and subtract whole numbers up to and including 1,000. • Use estimation strategies to assess reasonableness of answers.
	27. Reasoning About Addition and Subtraction Within 1,000	NC.3.NBT.2.ii	Add and subtract whole numbers up to and including 1,000. • Model and explain how the relationship between addition and subtraction can be applied to solve addition and subtraction problems.
Operations and Algebraic Thinking	28. Modeling and Solving Two-Step Word Problems	NC.3.OA.8	Solve two-step word problems using addition, subtraction, and multiplication, representing problems using equations with a symbol for the unknown number.
Number and Operations- Fractions	29. Understanding Fractions - Equal Areas	NC.3.NF.1.ii	Interpret unit fractions with denominators of 2, 3, 4, 6, and 8 as quantities formed when a whole is partitioned into equal parts; • represent and identify unit fractions using area and length models.
	30. Understanding Fractions - Notation	NC.3.NF.1.ii	Interpret unit fractions with denominators of 2, 3, 4, 6, and 8 as quantities formed when a whole is partitioned into equal parts; • represent and identify unit fractions using area and length models.
		NC.3.NF.2.i	Interpret fractions with denominators of 2, 3, 4, 6, and 8 using area and length models. • Using an area model, explain that the numerator of a fraction represents the number of equal parts of the unit fraction.
	31. Unit Fractions on the Number Line	NC.3.NF.2.ii	Interpret fractions with denominators of 2, 3, 4, 6, and 8 using area and length models. • Using a number line, explain that the numerator of a fraction represents the number of lengths of the unit fraction from 0.
		NC.3.NF.1.i	Interpret unit fractions with denominators of 2, 3, 4, 6, and 8 as quantities formed when a whole is partitioned into equal parts; • explain that a unit fraction is one of those parts.
	32. Fractions on the Number Line	NC.3.NF.2.ii	Interpret fractions with denominators of 2, 3, 4, 6, and 8 using area and length models. • Using a number line, explain that the numerator of a fraction represents the number of lengths of the unit fraction from 0.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
	33. Modeling Equivalent Fractions with Number Lines 34. Visual Models of Equivalent Fractions	NC.3.NF.3.i	Represent equivalent fractions with area and length models by: • Composing and decomposing fractions into equivalent fractions using related fractions: halves, fourths and eighths; thirds and sixths.
	35. Whole Numbers as Fractions 36. Whole Numbers as Fractions on the Number Line	NC.3.NF.3.ii	Represent equivalent fractions with area and length models by: • Explaining that a fraction with the same numerator and denominator equals one whole.
		NC.3.NF.3.iii	Represent equivalent fractions with area and length models by: • Expressing whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.
	37. Comparing Fractions with the Same Numerator or Denominator	NC.3.NF.4	Compare two fractions with the same numerator or the same denominator by reasoning about their size, using area and length models, and using the >, <, and = symbols. Recognize that comparisons are valid only when the two fractions refer to the same whole with denominators: halves, fourths and eighths; thirds and sixths.
	38. Recognizing Valid Fraction Comparisons I	NC.3.NF.4	Compare two fractions with the same numerator or the same denominator by reasoning about their size, using area and length models, and using the >, <, and = symbols. Recognize that comparisons are valid only when the two fractions refer to the same whole with denominators: halves, fourths and eighths; thirds and sixths.
		NC.4.NF.2.iii	Compare two fractions with different numerators and different denominators, using the denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions by: • comparing common numerator or common denominators.
Measurement and Data	39. Unit Squares 40. Concept of Area	NC.3.MD.5	Find the area of a rectangle with whole-number side lengths by tiling without gaps or overlaps and counting unit squares.
	41. Area of Rectangles	NC.3.MD.7.ii	Relate area to the operations of multiplication and addition. • Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving problems, and represent whole-number products as rectangular areas in mathematical reasoning.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.3.MD.7.i	Relate area to the operations of multiplication and addition. • Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
		NC.3.MD.7.iii	Relate area to the operations of multiplication and addition. • Use tiles and/or arrays to illustrate and explain that the area of a rectangle can be found by partitioning it into two smaller rectangles, and that the area of the large rectangle is the sum of the two smaller rectangles.
	42. Area of Basic Composite Figures	NC.4.MD.3.i	Solve problems with area and perimeter. • Find areas of rectilinear figures with known side lengths.
	43. Perimeter	NC.3.MD.8	Solve problems involving perimeters of polygons, including finding the perimeter given the side lengths, and finding an unknown side length.
Geometry	44. Classifying Quadrilaterals I	NC.3.G.1.i	Reason with two-dimensional shapes and their attributes. • Investigate, describe, and reason about composing triangles and quadrilaterals and decomposing quadrilaterals.
		NC.3.G.1.ii	Reason with two-dimensional shapes and their attributes. • Recognize and draw examples and non-examples of types of quadrilaterals including rhombuses, rectangles, squares, parallelograms, and trapezoids.
Measurement and Data	45. Capacity or Weight	NC.3.MD.2.ii	Solve problems involving customary measurement. • Estimate and measure capacity and weight in customary units to a whole number: cups, pints, quarts, gallons, ounces, and pounds.
		NC.3.MD.2.iii	Solve problems involving customary measurement. • Add, subtract, multiply, or divide to solve one-step word problems involving whole number measurements of length, weight, and capacity in the same customary units.
	46. Money Sense	NC.2.MD.8.i	Solve word problems involving: • quarters, dimes, nickels, and pennies within 99¢, using ¢ symbols appropriately.
		NC.2.MD.8.ii	Solve word problems involving: • whole dollar amounts, using the $ symbol appropriately.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
	47. Adding and Subtracting Time	NC.3.MD.1	Tell and write time to the nearest minute. Solve word problems involving addition and subtraction of time intervals within the same hour.
		NC.4.MD.8	Solve word problems involving addition and subtraction of time intervals that cross the hour.
	48. Introduction to Data Displays	NC.3.MD.3.i	Represent and interpret scaled picture and bar graphs. • Collect data by asking a question that yields data in up to four categories.
		NC.3.MD.3.iii	Represent and interpret scaled picture and bar graphs. • Solve one and two-step "how many more" and "how many less" problems using information from these graphs
		NC.3.MD.3.ii	Represent and interpret scaled picture and bar graphs. • Make a representation of data and interpret data in a frequency table, scaled picture graph, and/or scaled bar graph with axes provided.
Operations and Algebraic Thinking	49. Additive and Multiplicative Patterns	NC.3.OA.9	Interpret patterns of multiplication on a hundreds board and/or multiplication table.

Grade 4

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Number and Operations in Base Ten	1. Visualizing Place Value Relationships	Not applicable	
	2. Visualizing Rounding	Not applicable	
Operations and Algebraic Thinking	3. Visualizing Addition and Subtraction	Not applicable	
	4. Visualizing Multiplication and Division	Not applicable	
	5. Developing Fluency Using 2 as a Factor 6. Developing Fluency Using 5 or 10 as a Factor 7. Using Halves and Doubles to Solve Multiplication Problems	NC.3.OA.7.i	Demonstrate fluency with multiplication and division with factors, quotients and divisors up to and including 10. • Know from memory all products with factors up to and including 10.
Number and Operations in Base Ten	8. Adding Whole Numbers 9. Adding and Subtracting with the Standard Algorithm	NC.4.NBT.4	Add and subtract multi-digit whole numbers up to and including 100,000 using the standard algorithm with place value understanding.
	10. Place Value Concepts	NC.4.NBT.2	Read and write multi-digit whole numbers up to and including 100,000 using numerals, number names, and expanded form.
	11. Using Place Value Concepts to Compare Whole Numbers	NC.4.NBT.7	Compare two multi-digit numbers up to and including 100,000 based on the values of the digits in each place, using >, =, and < symbols to record the results of comparisons.
	12. Understanding Place Value Relationships	NC.4.NBT.1	Explain that in a multi-digit whole number, a digit in one place represents 10 times as much as it represents in the place to its right, up to 100,000.
	13. Rounding Whole Numbers 14. Using Rounding in Problem Solving	NC.4.OA.3.i	Solve two-step word problems involving the four operations with whole numbers. • Use estimation strategies to assess reasonableness of answers.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
	15. Multiplying Whole Numbers 16. Multiplying 2-Digit Numbers by 2-Digit Numbers	NC.4.NBT.5	Multiply a whole number of up to three digits by a one-digit whole number, and multiply up to two two-digit numbers with place value understanding using area models, partial products, and the properties of operations. Use models to make connections and develop the algorithm.
Operations and Algebraic Thinking	17. Multiplication as a Comparison - Equations 18. Multiplication as a Comparison - Word Problems	NC.4.OA.1	Interpret a multiplication equation as a comparison. Multiply or divide to solve word problems involving multiplicative comparisons using models and equations with a symbol for the unknown number. Distinguish multiplicative comparison from additive comparison.
Number and Operations in Base Ten	19. Dividing Multiples of Ten	NC.4.NBT.6	Find whole-number quotients and remainders with up to three-digit dividends and one-digit divisors with place value understanding using rectangular arrays, area models, repeated subtraction, partial quotients, properties of operations, and/or the relationship between multiplication and division.
Operations and Algebraic Thinking	20. Interpreting Remainders 21. Using Equations to Model and Solve Multi-step Problems	NC.4.OA.3.ii	Solve two-step word problems involving the four operations with whole numbers. • Interpret remainders in word problems.
		NC.4.OA.3.iii	Solve two-step word problems involving the four operations with whole numbers. • Represent problems using equations with a letter standing for the unknown quantity.
Number and Operations in Base Ten	22. Estimating Solutions to Multistep Word Problems	NC.4.OA.3.i	Solve two-step word problems involving the four operations with whole numbers. • Use estimation strategies to assess reasonableness of answers.
Operations and Algebraic Thinking	23. Factors	NC.4.OA.4.i	Find all factor pairs for whole numbers up to and including 50 to: • recognize that a whole number is a multiple of each of its factors.
	24. Relating Factors and Multiples I 25. Relating Factors and Multiples II	NC.4.OA.4.i	Find all factor pairs for whole numbers up to and including 50 to: • recognize that a whole number is a multiple of each of its factors.
		NC.4.OA.4.ii	Find all factor pairs for whole numbers up to and including 50 to: • determine whether a given whole number is a multiple of a given one-digit number.
		NC.4.OA.4.iii	Find all factor pairs for whole numbers up to and including 50 to: • determine if the number is prime or composite.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Number and Operations- Fractions	26. Modeling Equivalent Fractions 27. Generating Equivalent Fractions 28. Reducing Fractions	NC.4.NF.1	Explain why a fraction is equivalent to another fraction by using area and length fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size.
	29. Comparing Fractions - Visual Models 30. Comparing Fractions with Different Numerators and Different Denominators 31. Recognizing Valid Fraction Comparisons II	NC.4.NF.2.i	Compare two fractions with different numerators and different denominators, using the denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions by: • reasoning about their size and using area and length models.
		NC.4.NF.2.ii	Compare two fractions with different numerators and different denominators, using the denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions by: • using benchmark fractions 0, 1/2, and a whole.
	32. Adding and Subtracting Fractions with Like Denominators 33. Adding and Subtracting Fractions with Like Denominators in Real-World Situations	NC.4.NF.3.i	Understand and justify decompositions of fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, and 100. • Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
	34. Decomposing Fractions and Mixed Numbers 35. Writing Fractions as Mixed Numbers and Mixed Numbers as Fractions	NC.4.NF.3.ii	Understand and justify decompositions of fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, and 100. • Decompose a fraction into a sum of unit fractions and a sum of fractions with the same denominator in more than one way using area models, length models, and equations.
	36. Understanding Fractions - Relationship Between Numerator and Denominator	NC.4.NF.1	Explain why a fraction is equivalent to another fraction by using area and length fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	37. Word Problems with Fractions and Mixed Numbers - Visual Models 38. Word Problems with Fractions and Mixed Numbers - Estimation	NC.4.NF.3.iv	Understand and justify decompositions of fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, and 100. • Solve word problems involving addition and subtraction of fractions, including mixed numbers by writing equations from a visual representation of the problem.
	39. Adding and Subtracting Mixed Numbers with Like Denominators - Conceptual Strategies 40. Adding and Subtracting Mixed Numbers with Like Denominators	NC.4.NF.3.iii	Understand and justify decompositions of fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, and 100. • Add and subtract fractions, including mixed numbers with like denominators, by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
	41. Multiplying Unit Fractions by Whole Numbers 42. Multiplying Fractions by Whole Numbers	NC.4.NF.4.i	Apply and extend previous understandings of multiplication to: • model and explain how fractions can be represented by multiplying a whole number by a unit fraction, using this understanding to multiply a whole number by any fraction less than one.
	43. Solving Word Problems with Multiplication of Fractions by Whole Numbers	NC.4.NF.4.ii	Apply and extend previous understandings of multiplication to: • solve word problems involving multiplication of a fraction by a whole number.
	44. Understanding Fractions with Denominators of 10 and 100	NC.4.NF.6.i	Use decimal notation to represent fractions. • Express, model and explain the equivalence between fractions with denominators of 10 and 100.
	45. Adding Fractions with Denominators of 10 or 100	NC.4.NF.6.ii	Use decimal notation to represent fractions. • Use equivalent fractions to add two fractions with denominators of 10 or 100.
		NC.4.NF.6.i	Use decimal notation to represent fractions. • Express, model and explain the equivalence between fractions with denominators of 10 and 100.
	46. Comparing Decimal Fractions	NC.4.NF.6.iii	Use decimal notation to represent fractions. • Represent tenths and hundredths with models, making connections between fractions and decimals.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Number and Operations in Base Ten	47. Comparing and Ordering Decimal Fractions 48. Decimal Notation I 49. Decimal Notation II	NC.4.NF.6.iii	Use decimal notation to represent fractions. • Represent tenths and hundredths with models, making connections between fractions and decimals.
	50. Decimals to Hundredths 51. Introduction to Comparing Decimals to Hundredths 52. Comparing Decimals to Hundredths 53. Recognizing Valid Decimal Comparisons	NC.4.NF.7	Compare two decimals to hundredths by reasoning about their size using area and length models, and recording the results of comparisons with the symbols >, =, or <. Recognize that comparisons are valid only when the two decimals refer to the same whole.
	54. Fraction and Decimal Equivalents	NC.4.NF.6.iii	Use decimal notation to represent fractions. • Represent tenths and hundredths with models, making connections between fractions and decimals.
		NC.5.NBT.3.i	Read, write, and compare decimals to thousandths. • Write decimals using base-ten numerals, number names, and expanded form.
	55. Recognizing Area as Additive	NC.4.MD.3.i	Solve problems with area and perimeter. • Find areas of rectilinear figures with known side lengths.
	56. Comparing Fractions and Decimals	NC.4.NF.6.iii	Use decimal notation to represent fractions. • Represent tenths and hundredths with models, making connections between fractions and decimals.
		NC.5.NBT.3.i	Read, write, and compare decimals to thousandths. • Write decimals using base-ten numerals, number names, and expanded form.
Measurement and Data	57. Area and Perimeter of Rectangles	NC.4.MD.3.iii	Solve problems with area and perimeter. • Apply the area and perimeter formulas for rectangles in real world and mathematical problems.
		NC.4.MD.3.i	Solve problems with area and perimeter. • Find areas of rectilinear figures with known side lengths.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
	58. Identifying and Comparing Angles	NC.4.MD.6.i	Develop an understanding of angles and angle measurement. • Understand angles as geometric shapes that are formed wherever two rays share a common endpoint, and are measured in degrees.
	59. Angles	NC.4.MD.6.ii	Develop an understanding of angles and angle measurement. • Measure and sketch angles in whole-number degrees using a protractor.
		NC.4.MD.6.iii	Develop an understanding of angles and angle measurement. • Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems.
		NC.4.MD.6.i	Develop an understanding of angles and angle measurement. • Understand angles as geometric shapes that are formed wherever two rays share a common endpoint, and are measured in degrees.
Geometry	60. Identifying and Classifying Lines, Rays, and Segments	NC.4.G.1	Draw and identify points, lines, line segments, rays, angles, and perpendicular and parallel lines.
	61. Classifying Triangles 62. Classifying Quadrilaterals II	NC.4.G.1	Draw and identify points, lines, line segments, rays, angles, and perpendicular and parallel lines.
		NC.4.G.2	Classify quadrilaterals and triangles based on angle measure, side lengths, and the presence or absence of parallel or perpendicular lines.
	63. Symmetry	NC.4.G.3	Recognize symmetry in a two-dimensional figure, and identify and draw lines of symmetry.
Measurement and Data	64. Units of Measure - Metric	NC.4.MD.2	Use multiplicative reasoning to convert metric measurements from a larger unit to a smaller unit using place value understanding, two-column tables, and length models.
		NC.4.MD.1.i	Know relative sizes of measurement units. Solve problems involving metric measurement. • Measure to solve problems involving metric units: centimeter, meter, gram, kilogram, Liter, milliliter.
		NC.4.MD.1.ii	Know relative sizes of measurement units. Solve problems involving metric measurement. • Add, subtract, multiply, and divide to solve one-step word problems involving whole-number measurements of length, mass, and capacity that are given in metric units.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
	65. Generating and Describing Number Patterns	NC.4.OA.5	Generate and analyze a number or shape pattern that follows a given rule.
	66. Line Plots	NC.4.MD.4.ii	Represent and interpret data using whole numbers. • Make a representation of data and interpret data in a frequency table, scaled bar graph, and/or line plot.
		NC.5.MD.2.ii	Represent and interpret data. • Make and interpret a representation of data using a line graph.

Grade 5

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Number and Operations in Base Ten	1. Multiplying Whole Numbers - Standard Algorithm 2. Multiplying 3-digit by 2-digit Whole Numbers Using the Standard Algorithm	NC.5.NBT.5	Demonstrate fluency with the multiplication of two whole numbers up to a three-digit number by a two-digit number using the standard algorithm.
	3. Dividing Whole Numbers - Two-Digit Divisors	NC.5.NBT.6	Find quotients with remainders when dividing whole numbers with up to four-digit dividends and two-digit divisors using rectangular arrays, area models, repeated subtraction, partial quotients, and/or the relationship between multiplication and division. Use models to make connections and develop the algorithm.
Number and Operations- Fractions	4. Understanding Fractions as Division	NC.5.NF.3.i	Use fractions to model and solve division problems. • Interpret a fraction as an equal sharing context, where a quantity is divided into equal parts.
		NC.5.NF.3.ii	Use fractions to model and solve division problems. • Model and interpret a fraction as the division of the numerator by the denominator.
		NC.5.NF.3.iii	Use fractions to model and solve division problems. • Solve one-step word problems involving division of whole numbers leading to answers in the form of fractions and mixed numbers, with denominators of 2, 3, 4, 5, 6, 8, 10, and 12, using area, length, and set models or equations.
	5. Adding Fractions 6. Adding Fractions - Estimation Strategies 7. Subtracting Fractions 8. Subtracting Fractions - Estimation Strategies	NC.5.NF.1.i	Add and subtract fractions, including mixed numbers, with unlike denominators using related fractions: halves, fourths and eighths; thirds, sixths, and twelfths; fifths, tenths, and hundredths. • Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	9. Understanding Products with Fractions	NC.5.NF.4.ii	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction, including mixed numbers. • Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number and when multiplying a given number by a fraction less than 1 results in a product smaller than the given number.
	10. Multiplying Fractions by Fractions	NC.5.NF.4.i	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction, including mixed numbers. • Use area and length models to multiply two fractions, with the denominators 2, 3, 4.
	11. Multiplying with Fractions and Mixed Numbers	NC.5.NF.4.iii	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction, including mixed numbers. • Solve one-step word problems involving multiplication of fractions using models to develop the algorithm.
	12. Adding and Subtracting Fractions 13. Adding and Subtracting Fractions - Multistep Word Problems	NC.5.NF.1.i	Add and subtract fractions, including mixed numbers, with unlike denominators using related fractions: halves, fourths and eighths; thirds, sixths, and twelfths; fifths, tenths, and hundredths. • Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
		NC.5.NF.1.ii	Add and subtract fractions, including mixed numbers, with unlike denominators using related fractions: halves, fourths and eighths; thirds, sixths, and twelfths; fifths, tenths, and hundredths. • Solve one- and two-step word problems in context using area and length models to develop the algorithm. Represent the word problem in an equation.
	14. Dividing Unit Fractions by Whole Numbers 15. Dividing Whole Numbers by Unit Fractions	NC.5.NF.7	Solve one-step word problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions using area and length models, and equations to represent the problem

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Number and Operations in Base Ten	16. Decimals to Thousandths	NC.5.NBT.3.i	Read, write, and compare decimals to thousandths. • Write decimals using base-ten numerals, number names, and expanded form.
	17. Comparing Decimals to Thousandths	NC.5.NBT.3.ii	Read, write, and compare decimals to thousandths. • Compare two decimals to thousandths based on the value of the digits in each place, using >, =, and < symbols to record the results of comparisons.
	18. Fraction and Decimal Equivalents	NC.4.NF.6.iii	Use decimal notation to represent fractions. Represent tenths and hundredths with models, making connections between fractions and decimals.
	19. Comparing Fractions and Decimals	NC.5.NBT.3.i	Read, write, and compare decimals to thousandths. Write decimals using base-ten numerals, number names, and expanded form.
	20. Rounding Decimals to the Nearest Tenth and Hundredth 21. Reasoning About Rounding Decimals	NC.5.NBT.7.iv	Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. • Use estimation strategies to assess reasonableness of answers.
	22. Adding and Subtracting Decimals 23. Adding and Subtracting Decimals in Real-World Situations	NC.5.NBT.7.i	Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. • Add and subtract decimals to thousandths using models, drawings or strategies based on place value.
		NC.6.NS.3	Apply and extend previous understandings of decimals to develop and fluently use the standard algorithms for addition, subtraction, multiplication and division of decimals.
	24. Multiplying by Powers of Ten 25. Multiplying and Dividing by Powers of Ten	NC.5.NBT.1.ii	Explain the patterns in the place value system from one million to the thousandths place. • Explain patterns in products and quotients when numbers are multiplied by 1,000, 100, 10, 0.1, and 0.01 and/or divided by 10 and 100.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	26. Place Value Relationships Within Whole Numbers and Decimals	NC.5.NBT.1.i	Explain the patterns in the place value system from one million to the thousandths place. • Explain that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
	27. Multiplying Decimals to Hundredths	NC.5.NBT.7.ii	Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. • Multiply decimals with a product to thousandths using models, drawings, or strategies based on place value.
	28. Dividing Decimals to Hundredths	NC.5.NBT.7.iii	Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. • Divide a whole number by a decimal and divide a decimal by a whole number, using repeated subtraction or area models. Decimals should be limited to hundredths.
	29. Using Reasoning and Estimation to Calculate with Decimals	NC.5.NBT.7.iv	Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. • Use estimation strategies to assess reasonableness of answers.
		NC.6.NS.3	Apply and extend previous understandings of decimals to develop and fluently use the standard algorithms for addition, subtraction, multiplication and division of decimals.
	30. Calculating with Decimals	NC.5.NBT.7.ii	Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. • Multiply decimals with a product to thousandths using models, drawings, or strategies based on place value.
		NC.5.NBT.7.i	Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. • Add and subtract decimals to thousandths using models, drawings or strategies based on place value.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.6.NS.3	Apply and extend previous understandings of decimals to develop and fluently use the standard algorithms for addition, subtraction, multiplication and division of decimals.
Expressions and Equations	31. Evaluating Simple Expressions	NC.5.OA.2.i	Write, explain, and evaluate numerical expressions involving the four operations to solve up to two-step problems. Include expressions involving: • Parentheses, using the order of operations.
		NC.6.EE.2.iii	Write, read, and evaluate algebraic expressions. • Evaluate expressions at specific values of their variables using expressions that arise from formulas used in real-world problems.
Operations and Algebraic Thinking	32. Writing Simple Expressions 33. Writing and Interpreting Simple Expressions	NC.5.OA.2.ii	Write, explain, and evaluate numerical expressions involving the four operations to solve up to two-step problems. Include expressions involving: • Commutative, associative and distributive properties.
Geometry	34. Introduction to the Coordinate Plane 35. Representing Real-World Quantities in the First Quadrant 36. Introduction to Scatter Plots	NC.5.G.1	Graph points in the first quadrant of a coordinate plane, and identify and interpret the x and y coordinates to solve problems.
Measurement and Data	37. Volume of Rectangular Prisms I	NC.5.MD.4	Recognize volume as an attribute of solid figures and measure volume by counting unit cubes, using cubic centimeters, cubic inches, cubic feet, and improvised units.
	38. Volume of Rectangular Prisms II	NC.5.MD.5.iii	Relate volume to the operations of multiplication and addition. • Find volume of solid figures with one-digit dimensions composed of two non-overlapping rectangular prisms.
		NC.5.MD.5.ii	Relate volume to the operations of multiplication and addition. • Build understanding of the volume formula for rectangular prisms with whole-number edge lengths in the context of solving problems.

Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.5.MD.5.i	Relate volume to the operations of multiplication and addition. • Find the volume of a rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths.
Geometry	39. Classifying 2-Dimensional Figures	NC.5.G.3.i	Classify quadrilaterals into categories based on their properties. • Explain that attributes belonging to a category of quadrilaterals also belong to all subcategories of that category.
		NC.5.G.3.ii	Classify quadrilaterals into categories based on their properties. • Classify quadrilaterals in a hierarchy based on properties.
Measurement and Data	40. Line Plots	NC.4.MD.4.ii	Represent and interpret data using whole numbers. Make a representation of data and interpret data in a frequency table, scaled bar graph, and/or line plot.
		NC.5.MD.2.ii	Represent and interpret data. Make and interpret a representation of data using a line graph.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Number and Operations in Base Ten	1. Dividing Whole Numbers - Standard Algorithm	NC.6.NS.2	Fluently divide using long division with a minimum of a four-digit dividend and interpret the quotient and remainder in context.
	2. Adding and Subtracting Decimals 3. Adding and Subtracting Decimals in Real-World Situations	NC.5.NBT.7.i	Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. • Add and subtract decimals to thousandths using models, drawings or strategies based on place value.
		NC.6.NS.3	Apply and extend previous understandings of decimals to develop and fluently use the standard algorithms for addition, subtraction, multiplication and division of decimals.
	4. Using Reasoning and Estimation to Calculate with Decimals	NC.5.NBT.7.iv	Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. • Use estimation strategies to assess reasonableness of answers.
		NC.6.NS.3	Apply and extend previous understandings of decimals to develop and fluently use the standard algorithms for addition, subtraction, multiplication and division of decimals.
	5. Calculating with Decimals	NC.5.NBT.7.ii	Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. • Multiply decimals with a product to thousandths using models, drawings, or strategies based on place value.
		NC.5.NBT.7.i	Compute and solve real-world problems with multi-digit whole numbers and decimal numbers. • Add and subtract decimals to thousandths using models, drawings or strategies based on place value.
		NC.6.NS.3	Apply and extend previous understandings of decimals to develop and fluently use the standard algorithms for addition, subtraction, multiplication and division of decimals.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
The Number System	6. Greatest Common Factor	NC.6.NS.4.iii	Understand and use prime factorization and the relationships between factors to: • Use the greatest common factor and the distributive property to rewrite the sum of two whole numbers, each less than or equal to 100.
		NC.6.NS.4.i	Understand and use prime factorization and the relationships between factors to: • Find the unique prime factorization for a whole number.
		NC.6.NS.4.ii	Understand and use prime factorization and the relationships between factors to: • Find the greatest common factor of two whole numbers less than or equal to 100.
	7. Greatest Common Factor - Applications	NC.6.NS.4.i	Understand and use prime factorization and the relationships between factors to: • Find the unique prime factorization for a whole number.
		NC.6.NS.4.ii	Understand and use prime factorization and the relationships between factors to: • Find the greatest common factor of two whole numbers less than or equal to 100.
	8. Least Common Multiple	NC.6.NS.4.iv	Understand and use prime factorization and the relationships between factors to: • Find the least common multiple of two whole numbers less than or equal to 12 to add and subtract fractions with unlike denominators.
	9. Using the Relationship Between Multiplication and Division to Divide Fractions	NC.6.NS.1.i	Use visual models and common denominators to: • Interpret and compute quotients of fractions.
		NC.6.NS.1.ii	Use visual models and common denominators to: • Solve real-world and mathematical problems involving division of fractions.
	10. Dividing Fractions by Fractions	NC.6.NS.1.i	Use visual models and common denominators to: • Interpret and compute quotients of fractions.
	11. Using Division of Fractions to Represent and Solve Problems	NC.6.NS.1.ii	Use visual models and common denominators to: • Solve real-world and mathematical problems involving division of fractions.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
	12. Operations with Fractions - Mixed Practice	NC.6.NS.1.i	Use visual models and common denominators to: • Interpret and compute quotients of fractions.
Ratios and Proportional Relationships	13. Identifying Ratios	NC.6.RP.1.ii	Understand the concept of a ratio and use ratio language to: • Model a ratio relationship using a variety of representations.
		NC.6.RP.1.i	Understand the concept of a ratio and use ratio language to: • Describe a ratio as a multiplicative relationship between two quantities.
	14. Ratios	NC.6.RP.1.ii	Understand the concept of a ratio and use ratio language to: • Model a ratio relationship using a variety of representations.
		NC.6.RP.3.iii	Use ratio reasoning with equivalent whole-number ratios to solve real-world and mathematical problems by: • Using a unit ratio.
		NC.6.RP.1.i	Understand the concept of a ratio and use ratio language to: • Describe a ratio as a multiplicative relationship between two quantities.
	15. Concept of Ratios and Rates	NC.6.RP.1.ii	Understand the concept of a ratio and use ratio language to: • Model a ratio relationship using a variety of representations.
		NC.6.RP.2	Understand that ratios can be expressed as equivalent unit ratios by finding and interpreting both unit ratios in context.
		NC.6.RP.1.i	Understand the concept of a ratio and use ratio language to: • Describe a ratio as a multiplicative relationship between two quantities.
	16. Using Ratios to Solve Problems	NC.6.RP.3.ii	Use ratio reasoning with equivalent whole-number ratios to solve real-world and mathematical problems by: • Finding missing values in the tables.
		NC.6.RP.3.i	Use ratio reasoning with equivalent whole-number ratios to solve real-world and mathematical problems by: • Creating and using a table to compare ratios.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	17. Identifying Unit Rates	NC.6.RP.1.ii	Understand the concept of a ratio and use ratio language to: • Model a ratio relationship using a variety of representations.
		NC.6.RP.2	Understand that ratios can be expressed as equivalent unit ratios by finding and interpreting both unit ratios in context.
		NC.6.RP.1.i	Understand the concept of a ratio and use ratio language to: • Describe a ratio as a multiplicative relationship between two quantities.
	18. Solving Problems with Unit Rates	NC.6.RP.1.ii	Understand the concept of a ratio and use ratio language to: • Model a ratio relationship using a variety of representations.
		NC.6.RP.3.iii	Use ratio reasoning with equivalent whole-number ratios to solve real-world and mathematical problems by: • Using a unit ratio.
		NC.6.RP.2	Understand that ratios can be expressed as equivalent unit ratios by finding and interpreting both unit ratios in context.
		NC.6.RP.1.i	Understand the concept of a ratio and use ratio language to: • Describe a ratio as a multiplicative relationship between two quantities.
	19. Converting Units of Measure I 20. Converting Units of Measure II	NC.6.RP.3.iv	Use ratio reasoning with equivalent whole-number ratios to solve real-world and mathematical problems by: • Converting and manipulating measurements using given ratios.
	21. Distance, Rate, and Time	NC.6.RP.3.iv	Use ratio reasoning with equivalent whole-number ratios to solve real-world and mathematical problems by: • Converting and manipulating measurements using given ratios.
		NC.6.RP.3.iii	Use ratio reasoning with equivalent whole-number ratios to solve real-world and mathematical problems by: • Using a unit ratio.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	22. Percent Concepts	NC.6.RP.4.i	Use ratio reasoning to solve real-world and mathematical problems with percents by: • Understanding and finding a percent of a quantity as a ratio per 100.
	23. Reasoning with Percents	NC.6.RP.4.ii	Use ratio reasoning to solve real-world and mathematical problems with percents by: • Using equivalent ratios, such as benchmark percents (50%, 25%, 10%, 5%, 1%), to determine a part of any given quantity.
	24. Calculations with Percent	NC.6.RP.4.ii	Use ratio reasoning to solve real-world and mathematical problems with percents by: • Using equivalent ratios, such as benchmark percents (50%, 25%, 10%, 5%, 1%), to determine a part of any given quantity.
		NC.6.RP.4.iii	Use ratio reasoning to solve real-world and mathematical problems with percents by: • Finding the whole, given a part and the percent.
The Number System	25. Integer Concepts	NC.6.NS.6a	Understand rational numbers as points on the number line and as ordered pairs on a coordinate plane. a. On a number line: • Recognize opposite signs of numbers as indicating locations on opposite sides of 0 and that the opposite of the opposite of a number is the number itself. • Find and position rational numbers on a horizontal or vertical number line.
		NC.6.NS.5.ii	Understand and use rational numbers to: • Represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	26. Integer Concepts with a Number Line	NC.6.NS.6a	Understand rational numbers as points on the number line and as ordered pairs on a coordinate plane. a. On a number line: • Recognize opposite signs of numbers as indicating locations on opposite sides of 0 and that the opposite of the opposite of a number is the number itself. • Find and position rational numbers on a horizontal or vertical number line.
		NC.6.NS.5.i	Understand and use rational numbers to: • Describe quantities having opposite directions or values.
	27. Integers in the Coordinate Plane I 28. Integers in the Coordinate Plane II	NC.6.NS.6b	Understand rational numbers as points on the number line and as ordered pairs on a coordinate plane. b. On a coordinate plane: • Understand signs of numbers in ordered pairs as indicating locations in quadrants. • Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. • Find and position pairs of rational numbers on a coordinate plane.
	29. Comparing Rational Numbers I	NC.6.NS.6a	Understand rational numbers as points on the number line and as ordered pairs on a coordinate plane. a. On a number line: • Recognize opposite signs of numbers as indicating locations on opposite sides of 0 and that the opposite of the opposite of a number is the number itself. • Find and position rational numbers on a horizontal or vertical number line.
	30. Comparing Rational Numbers II	NC.6.NS.7a	Understand ordering of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
		NC.6.NS.7b	Understand ordering of rational numbers. b. Write, interpret, and explain statements of order for rational numbers in real-world contexts.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	31. Rational Numbers in the Coordinate Plane I	NC.6.NS.6b	Understand rational numbers as points on the number line and as ordered pairs on a coordinate plane. b. On a coordinate plane: • Understand signs of numbers in ordered pairs as indicating locations in quadrants. • Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. • Find and position pairs of rational numbers on a coordinate plane.
	32. Rational Numbers in the Coordinate Plane II	NC.6.NS.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
		NC.6.NS.6b	Understand rational numbers as points on the number line and as ordered pairs on a coordinate plane. b. On a coordinate plane: • Understand signs of numbers in ordered pairs as indicating locations in quadrants. • Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. • Find and position pairs of rational numbers on a coordinate plane.
	33. Absolute Value I	NC.6.NS.5.iii	Understand and use rational numbers to: • Understand the absolute value of a rational number as its distance from 0 on the number line to: ○ Interpret absolute value as magnitude for a positive or negative quantity in a real-world context. ○ Distinguish comparisons of absolute value from statements about order.
		NC.6.NS.9.iv	Apply and extend previous understandings of addition and subtraction. • Use models to add and subtract integers from -20 to 20 and describe real-world contexts using sums and differences.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.6.NS.9.iii	Apply and extend previous understandings of addition and subtraction. • Understand subtraction of integers as adding the additive inverse, p – q = p + (-q). Show that the distance between two integers on the number line is the absolute value of their difference.
	34. Absolute Value II	NC.6.NS.5.iii	Understand and use rational numbers to: • Understand the absolute value of a rational number as its distance from 0 on the number line to: o Interpret absolute value as magnitude for a positive or negative quantity in a real-world context. o Distinguish comparisons of absolute value from statements about order.
Geometry	35. Distance on the Coordinate Plane I	NC.6.G.3.ii	Use the coordinate plane to solve real-world and mathematical problems by: • Using coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate.
		NC.6.G.3.i	Use the coordinate plane to solve real-world and mathematical problems by: • Drawing polygons in the coordinate plane given coordinates for the vertices.
The Number System	36. Distance on the Coordinate Plane II	NC.6.NS.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
Expressions and Equations	37. Evaluating Simple Expressions	NC.5.OA.2.i	Write, explain, and evaluate numerical expressions involving the four operations to solve up to two-step problems. Include expressions involving: • Parentheses, using the order of operations.
		NC.6.EE.2.iii	Write, read, and evaluate algebraic expressions. • Evaluate expressions at specific values of their variables using expressions that arise from formulas used in real-world problems.
	38. Reasoning About One-Step Equations	NC.6.EE.5	Use substitution to determine whether a given number in a specified set makes an equation true.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	39. Writing and Solving One-Step Equations	NC.6.EE.7.ii	Solve real-world and mathematical problems by writing and solving equations of the form: • $p \cdot x = q$ for cases in which p, q and x are all nonnegative rational numbers.
		NC.6.EE.7.i	Solve real-world and mathematical problems by writing and solving equations of the form: • $x + p = q$ in which p, q, and x are all nonnegative rational numbers;
	40. Evaluating Expressions with Two Operations	NC.6.EE.2.iii	Write, read, and evaluate algebraic expressions. • Evaluate expressions at specific values of their variables using expressions that arise from formulas used in real-world problems.
	41. Evaluating Expressions with Real Numbers	NC.6.EE.2.ii	Write, read, and evaluate algebraic expressions. • Identify parts of an expression using mathematical terms and view one or more of those parts as a single entity.
	42. Understanding Exponents	NC.6.EE.1	Write and evaluate numerical expressions, with and without grouping symbols, involving whole-number exponents.
	43. Evaluating Expressions and Equations with Exponents	NC.6.EE.1	Write and evaluate numerical expressions, with and without grouping symbols, involving whole-number exponents.
		NC.6.EE.2.iii	Write, read, and evaluate algebraic expressions. • Evaluate expressions at specific values of their variables using expressions that arise from formulas used in real-world problems.
	44. Identifying and Generating Equivalent Expressions	NC.6.EE.3	Apply the properties of operations to generate equivalent expressions without exponents.
		NC.6.EE.4	Identify when two expressions are equivalent and justify with mathematical reasoning.
	45. Evaluating Expressions with the Distributive Property 46. Using the Distributive Property to Represent Real-World Situations	NC.6.EE.3	Apply the properties of operations to generate equivalent expressions without exponents.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Geometry	47. Area of Parallelograms	NC.6.G.1.ii	Create geometric models to solve real-world and mathematical problems to: • Find the area of special quadrilaterals and polygons by decomposing into triangles or rectangles.
	48. Area of Triangles	NC.6.G.1.i	Create geometric models to solve real-world and mathematical problems to: • Find the area of triangles by composing into rectangles and decomposing into right triangles.
	49. Area of Trapezoids and Composite Figures	NC.6.G.1.ii	Create geometric models to solve real-world and mathematical problems to: • Find the area of special quadrilaterals and polygons by decomposing into triangles or rectangles.
	50. Surface Area and Volume of Rectangular Prisms	NC.6.G.2	Apply and extend previous understandings of the volume of a right rectangular prism to find the volume of right rectangular prisms with fractional edge lengths. Apply this understanding to the context of solving real-world and mathematical problems.
		NC.6.G.4	Represent right prisms and right pyramids using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
		NC.7.G.6.ii	Solve real-world and mathematical problems involving: • Volume and surface area of pyramids, prisms, or three-dimensional objects composed of cubes, pyramids, and right prisms.
	51. Surface Area of Pyramids	NC.6.G.4	Represent right prisms and right pyramids using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
		NC.7.G.6.ii	Solve real-world and mathematical problems involving: • Volume and surface area of pyramids, prisms, or three-dimensional objects composed of cubes, pyramids, and right prisms.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Expressions and Equations	52. Independent and Dependent Quantities	NC.6.EE.9.ii	Represent and analyze quantitative relationships by: • Analyze the relationship between quantities in different representations (context, equations, tables, and graphs).
		NC.6.EE.9.i	Represent and analyze quantitative relationships by: • Using variables to represent two quantities in a real-world or mathematical context that change in relationship to one another.
Statistics and Probability	53. Measures of Spread - Range	NC.6.SP.3a	Understand that both a measure of center and a description of variability should be considered when describing a numerical data set. a. Determine the measure of center of a data set and understand that it is a single number that summarizes all the values of that data set. • Understand that a mean is a measure of center that represents a balance point or fair share of a data set and can be influenced by the presence of extreme values within the data set. • Understand the median as a measure of center that is the numerical middle of an ordered data set
		NC.6.SP.2	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
	54. Measures of Center - Median 55. Measures of Center - Mean	NC.6.SP.5b	Summarize numerical data sets in relation to their context. b. Analyze center and variability by: • Giving quantitative measures of center, describing variability, and any overall pattern, and noting any striking deviations. • Justifying the appropriate choice of measures of center using the shape of the data distribution.

Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.6.SP.3a	Understand that both a measure of center and a description of variability should be considered when describing a numerical data set. a. Determine the measure of center of a data set and understand that it is a single number that summarizes all the values of that data set. • Understand that a mean is a measure of center that represents a balance point or fair share of a data set and can be influenced by the presence of extreme values within the data set. • Understand the median as a measure of center that is the numerical middle of an ordered data set
		NC.6.SP.2	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
	56. Understanding the Effects of Outliers on Mean and Median	NC.6.SP.3b	Understand that both a measure of center and a description of variability should be considered when describing a numerical data set. b. Understand that describing the variability of a data set is needed to distinguish between data sets in the same scale, by comparing graphical representations of different data sets in the same scale that have similar measures of center, but different spreads.
		NC.6.SP.5b	Summarize numerical data sets in relation to their context. b. Analyze center and variability by: • Giving quantitative measures of center, describing variability, and any overall pattern, and noting any striking deviations. • Justifying the appropriate choice of measures of center using the shape of the data distribution.
	57. Deviation from the Mean	NC.6.SP.5b	Summarize numerical data sets in relation to their context. b. Analyze center and variability by: • Giving quantitative measures of center, describing variability, and any overall pattern, and noting any striking deviations. • Justifying the appropriate choice of measures of center using the shape of the data distribution.

Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.7.SP.3a	Recognize the role of variability when comparing two populations. a. Calculate the measure of variability of a data set and understand that it describes how the values of the data set vary with a single number. • Understand the mean absolute deviation of a data set is a measure of variability that describes the average distance that points within a data set are from the mean of the data set. • Understand that the range describes the spread of the entire data set. • Understand that the interquartile range describes the spread of the middle 50% of the data.
	58. Summarizing Data	NC.6.SP.5b	Summarize numerical data sets in relation to their context. b. Analyze center and variability by: • Giving quantitative measures of center, describing variability, and any overall pattern, and noting any striking deviations. • Justifying the appropriate choice of measures of center using the shape of the data distribution.
		NC.6.SP.5a	Summarize numerical data sets in relation to their context. a. Describe the collected data by: • Reporting the number of observations in dot plots and histograms. • Communicating the nature of the attribute under investigation, how it was measured, and the units of measurement.
		NC.6.SP.2	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
	59. Data Analysis	NC.6.SP.1	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.
	60. Bar Graphs and Histograms 61. Circle Graphs	NC.6.SP.4.i	Display numerical data in plots on a number line. • Use dot plots, histograms, and box plots to represent data.
	62. Stem-and-Leaf Plots	NC.6.SP.4.i	Display numerical data in plots on a number line. • Use dot plots, histograms, and box plots to represent data.

Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.6.SP.5a	Summarize numerical data sets in relation to their context. a. Describe the collected data by: • Reporting the number of observations in dot plots and histograms. • Communicating the nature of the attribute under investigation, how it was measured, and the units of measurement.
		NC.6.SP.2	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
	63. Quartiles	NC.6.SP.3a	Understand that both a measure of center and a description of variability should be considered when describing a numerical data set. a. Determine the measure of center of a data set and understand that it is a single number that summarizes all the values of that data set. • Understand that a mean is a measure of center that represents a balance point or fair share of a data set and can be influenced by the presence of extreme values within the data set. • Understand the median as a measure of center that is the numerical middle of an ordered data set
		NC.6.SP.2	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
	64. Box Plots	NC.6.SP.5b	Summarize numerical data sets in relation to their context. b. Analyze center and variability by: • Giving quantitative measures of center, describing variability, and any overall pattern, and noting any striking deviations. • Justifying the appropriate choice of measures of center using the shape of the data distribution.
		NC.6.SP.4.i	Display numerical data in plots on a number line. • Use dot plots, histograms, and box plots to represent data.
		NC.6.SP.2	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Expressions and Equations	65. Introduction to the Language of Algebra	NC.6.EE.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem.
		NC.6.EE.2.i	Write, read, and evaluate algebraic expressions. • Write expressions that record operations with numbers and with letters standing for numbers.
	66. Combining Like Terms	NC.6.EE.4	Identify when two expressions are equivalent and justify with mathematical reasoning.
	67. Introduction to Solving Word Problems with Algebra	NC.6.EE.7.ii	Solve real-world and mathematical problems by writing and solving equations of the form: • $p \cdot x = q$ for cases in which p, q and x are all nonnegative rational numbers.
		NC.6.EE.7.i	Solve real-world and mathematical problems by writing and solving equations of the form: • $x + p = q$ in which p, q, and x are all nonnegative rational numbers;
	68. Concept of Inequalities I	NC.6.EE.8.i	Reason about inequalities by: • Using substitution to determine whether a given number in a specified set makes an inequality true.
		NC.6.EE.8.ii	Reason about inequalities by: • Writing an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem.
		NC.6.EE.8.iii	Reason about inequalities by: • Recognizing that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions.
		NC.6.EE.8.iv	Reason about inequalities by: • Representing solutions of inequalities on number line diagrams.

Grade 7

NC Mathematics Standard Course of Study

Grade 7 NC Mathematics Standard Course of Study

Unit	Imagine Math Lesson	Standard Code	Standards Description
Ratios and Proportional Relationships	1. Proportion Concepts	NC.7.NS.2c	Apply and extend previous understandings of multiplication and division. c. Use division and previous understandings of fractions and decimals. • Convert a fraction to a decimal using long division. • Understand that the decimal form of a rational number terminates in 0s or eventually repeats.
	2. Proportional Relationships in Tables and Equations	NC.7.NS.2a	Apply and extend previous understandings of multiplication and division. a. Understand that a rational number is any number that can be written as a quotient of integers with a non-zero divisor.
	3. Direct Variation	NC.7.RP.2a	Recognize and represent proportional relationships between quantities. a. Understand that a proportion is a relationship of equality between ratios. • Represent proportional relationships using tables and graphs. • Recognize whether ratios are in a proportional relationship using tables and graphs. • Compare two different proportional relationships using tables, graphs, equations, and verbal descriptions.
		NC.8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate quantitative data, interpreting the slope and y-intercept.
	4. Interpreting Unit Rates on Graphs	NC.7.RP.2b	Recognize and represent proportional relationships between quantities. b. Identify the unit rate (constant of proportionality) within two quantities in a proportional relationship using tables, graphs, equations, and verbal descriptions.
	5. Interpreting Points on Graphs of Proportional Relationships	NC.7.RP.2d	Recognize and represent proportional relationships between quantities. d. Use a graphical representation of a proportional relationship in context to: • Explain the meaning of any point (x, y). • Explain the meaning of (0, 0) and why it is included. • Understand that the y-coordinate of the ordered pair (1, r) corresponds to the unit rate and explain its meaning.
		NC.7.RP.1	Compute unit rates associated with ratios of fractions to solve real-world and mathematical problems.
	6. Using Proportions to Solve Problems	NC.7.RP.3	Use scale factors and unit rates in proportional relationships to solve ratio and percent problems.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	7. Proportions in Scale Drawings	NC.7.G.1.ii	Solve problems involving scale drawings of geometric figures by: • Using a scale factor to compute actual lengths and areas from a scale drawing.
		NC.7.G.1.iii	Solve problems involving scale drawings of geometric figures by: • Creating a scale drawing.
		NC.7.G.1.i	Solve problems involving scale drawings of geometric figures by: • Building an understanding that angle measures remain the same and side lengths are proportional.
		NC.7.RP.3	Use scale factors and unit rates in proportional relationships to solve ratio and percent problems.
	8. Introduction to Similar Figures	NC.7.G.1.i	Solve problems involving scale drawings of geometric figures by: • Building an understanding that angle measures remain the same and side lengths are proportional.
		NC.7.RP.2c	Recognize and represent proportional relationships between quantities. c. Create equations and graphs to represent proportional relationships.
	9. Using Similar Figures to Solve Problems	NC.7.G.1.ii	Solve problems involving scale drawings of geometric figures by: • Using a scale factor to compute actual lengths and areas from a scale drawing.
		NC.7.G.1.iii	Solve problems involving scale drawings of geometric figures by: • Creating a scale drawing.
		NC.7.RP.2c	Recognize and represent proportional relationships between quantities. c. Create equations and graphs to represent proportional relationships.
	10. Similarity	NC.7.G.1.i	Solve problems involving scale drawings of geometric figures by: • Building an understanding that angle measures remain the same and side lengths are proportional.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
Number and Operations- Fractions	11. Using Division to Write Fractions as Decimals	NC.7.NS.2c	Apply and extend previous understandings of multiplication and division. c. Use division and previous understandings of fractions and decimals. • Convert a fraction to a decimal using long division. • Understand that the decimal form of a rational number terminates in 0s or eventually repeats.
Expressions and Equations	12. Fraction, Decimal, and Percent Equivalents	NC.7.EE.3.i	Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. • Apply properties of operations to calculate with positive and negative numbers in any form.
		NC.7.EE.3.ii	Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. • Convert between different forms of a number and equivalent forms of the expression as appropriate.
Ratios and Proportional Relationships	13. Percent and Percent Change 14. Percent and Percent Error 15. Simple Interest	NC.7.RP.3	Use scale factors and unit rates in proportional relationships to solve ratio and percent problems.
Expressions and Equations	16. Solving and Modeling Two-Step Problems 17. Solving Equations with the Distributive Property 18. Solving Equations with the Distributive Property in Context	NC.7.EE.4a	Use variables to represent quantities to solve real-world or mathematical problems. a. Construct equations to solve problems by reasoning about the quantities. • Fluently solve multistep equations with the variable on one side, including those generated by word problems. • Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. • Interpret the solution in context.
The Number System	19. Adding and Subtracting Rational Numbers I 20. Adding and Subtracting Rational Numbers II	NC.7.NS.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers, using the properties of operations, and describing real-world contexts using sums and differences.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	21. Multiplying and Dividing Rational Numbers	NC.7.NS.2c	Apply and extend previous understandings of multiplication and division. c. Use division and previous understandings of fractions and decimals. • Convert a fraction to a decimal using long division. • Understand that the decimal form of a rational number terminates in 0s or eventually repeats.
		NC.7.NS.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers, using the properties of operations, and describing real-world contexts using sums and differences.
		NC.7.NS.2b	Apply and extend previous understandings of multiplication and division. b. Apply properties of operations as strategies, including the standard algorithms, to multiply and divide rational numbers and describe the product and quotient in real-world contexts.
		NC.7.NS.2a	Apply and extend previous understandings of multiplication and division. a. Understand that a rational number is any number that can be written as a quotient of integers with a non-zero divisor.
Number and Operations- Fractions	22. Understanding and Multiplying with Negative Mixed Numbers	NC.7.NS.2b	Apply and extend previous understandings of multiplication and division. b. Apply properties of operations as strategies, including the standard algorithms, to multiply and divide rational numbers and describe the product and quotient in real-world contexts.
The Number System	23. Writing and Interpreting Expressions with Rational Numbers	NC.7.EE.3.i	Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. • Apply properties of operations to calculate with positive and negative numbers in any form.
		NC.7.NS.3	Solve real-world and mathematical problems involving numerical expressions with rational numbers using the four operations.
	24. Operations with Rational Numbers I	NC.7.NS.3	Solve real-world and mathematical problems involving numerical expressions with rational numbers using the four operations.
	25. Operations with Rational Numbers II	NC.7.EE.3.i	Solve multi-step real-world and mathematical problems posed with rational numbers in algebraic expressions. • Apply properties of operations to calculate with positive and negative numbers in any form.

Grade 7 NC Mathematics Standard Course of Study

Unit	Imagine Math Lesson	Standard Code	Standards Description
Expressions and Equations	26. Solving Word Problems with Algebra	NC.7.EE.2	Understand that equivalent expressions can reveal real-world and mathematical relationships. Interpret the meaning of the parts of each expression in context.
	27. Common Factors in Polynomials	NC.7.EE.1.i	Apply properties of operations as strategies to: • Add, subtract, and expand linear expressions with rational coefficients.
		NC.7.EE.1.ii	Apply properties of operations as strategies to: • Factor linear expression with an integer GCF.
	28. Modeling, Evaluating, and Graphing Two-Step Inequalities in One Variable	NC.7.EE.4b	Use variables to represent quantities to solve real-world or mathematical problems. b. Construct inequalities to solve problems by reasoning about the quantities. • Fluently solve multi-step inequalities with the variable on one side, including those generated by word problems. • Compare an algebraic solution process for equations and an algebraic solution process for inequalities. • Graph the solution set of the inequality and interpret in context.
Geometry	29. Circumference 30. Area of Circles	NC.7.G.4.ii	Understand area and circumference of a circle. • Apply the formulas for area and circumference of a circle to solve problems.
		NC.7.G.4.i	Understand area and circumference of a circle. • Understand the relationships between the radius, diameter, circumference, and area.
	31. Surface Area and Volume of Rectangular Prisms	NC.6.G.2	Apply and extend previous understandings of the volume of a right rectangular prism to find the volume of right rectangular prisms with fractional edge lengths. Apply this understanding to the context of solving real-world and mathematical problems.
		NC.6.G.4	Represent right prisms and right pyramids using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
		NC.7.G.6.ii	Solve real-world and mathematical problems involving: • Volume and surface area of pyramids, prisms, or three-dimensional objects composed of cubes, pyramids, and right prisms.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	32. Area of Complex Composite Figures	NC.6.G.1.ii	Create geometric models to solve real-world and mathematical problems to: • Find the area of special quadrilaterals and polygons by decomposing into triangles or rectangles.
		NC.7.G.6.i	Solve real-world and mathematical problems involving: • Area and perimeter of two-dimensional objects composed of triangles, quadrilaterals, and polygons.
	33. Surface Area of Pyramids	NC.6.G.4	Represent right prisms and right pyramids using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.
		NC.7.G.6.ii	Solve real-world and mathematical problems involving: • Volume and surface area of pyramids, prisms, or three-dimensional objects composed of cubes, pyramids, and right prisms.
	34. Surface Area of Cylinders 35. Surface Area of Cones	NC.7.G.4.ii	Understand area and circumference of a circle. • Apply the formulas for area and circumference of a circle to solve problems.
		NC.7.G.6.ii	Solve real-world and mathematical problems involving: • Volume and surface area of pyramids, prisms, or three-dimensional objects composed of cubes, pyramids, and right prisms.
	36. Angle Pairs	NC.7.G.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve equations for an unknown angle in a figure.
	37. Angles in a Polygon	NC.7.G.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve equations for an unknown angle in a figure.
		NC.8.G.5.iv	Use informal arguments to analyze angle relationships. • Solve real-world and mathematical problems involving angles.
		NC.8.G.5.i	Use informal arguments to analyze angle relationships. • Recognize relationships between interior and exterior angles of a triangle.
	38. Using Line Segments and Angles to Make Triangles	NC.7.G.2	Understand the characteristics of angles and side lengths that create a unique triangle, more than one triangle or no triangle. Build triangles from three measures of angles and/or sides.

Grade 7 NC Mathematics Standard Course of Study

Unit	Imagine Math Lesson	Standard Code	Standards Description
Statistics and Probability	39. Sampling	NC.7.SP.2	Generate multiple random samples (or simulated samples) of the same size to gauge the variation in estimates or predictions, and use this data to draw inferences about a population with an unknown characteristic of interest.
		NC.7.SP.4	Use measures of center and measures of variability for numerical data from random samples to draw comparative inferences about two populations.
	40. Comparing Data	NC.7.SP.3b	Recognize the role of variability when comparing two populations. b. Informally assess the difference between two data sets by examining the overlap and separation between the graphical representations of two data sets.
	41. Probability and Sample Spaces	NC.7.SP.8b	Determine probabilities of compound events using organized lists, tables, tree diagrams, and simulation. b. For an event described in everyday language, identify the outcomes in the sample space which compose the event, when the sample space is represented using organized lists, tables, and tree diagrams.
		NC.7.SP.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.
	42. Simple Probability	NC.7.SP.7b	Develop a probability model and use it to find probabilities of simple events. b. Develop a probability model (which may not be uniform) by repeatedly performing a chance process and observing frequencies in the data generated.
		NC.7.SP.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.
	43. Compound Probability	NC.7.SP.8a	Determine probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
		NC.7.SP.7a	Develop a probability model and use it to find probabilities of simple events. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.
	44. Simulations of Simple and Compound Events	NC.7.SP.8c	Determine probabilities of compound events using organized lists, tables, tree diagrams, and simulation. c. Design and use a simulation to generate frequencies for compound events.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	45. Making Predictions	NC.7.SP.6	Collect data to calculate the experimental probability of a chance event, observing its long-run relative frequency. Use this experimental probability to predict the approximate relative frequency.
	46. Concept of Inequalities II	NC.7.EE.4b	Use variables to represent quantities to solve real-world or mathematical problems. b. Construct inequalities to solve problems by reasoning about the quantities. • Fluently solve multi-step inequalities with the variable on one side, including those generated by word problems. • Compare an algebraic solution process for equations and an algebraic solution process for inequalities. • Graph the solution set of the inequality and interpret in context.

Grade 8

NC Mathematics Standard Course of Study

Unit	Imagine Math Lesson	Standard Code	Standards Description
Expressions and Equations	1. Interpreting Slope	NC.8.F.4.iv	Analyze functions that model linear relationships. • Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of the slope and y-intercept of its graph or a table of values.
	2. Slope	NC.8.F.1.i	Understand that a function is a rule that assigns to each input exactly one output. • Recognize functions when graphed as the set of ordered pairs consisting of an input and exactly one corresponding output.
		NC.8.F.4.iv	Analyze functions that model linear relationships. • Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of the slope and y-intercept of its graph or a table of values.
		NC.8.F.1.ii	Understand that a function is a rule that assigns to each input exactly one output. • Recognize functions given a table of values or a set of ordered pairs.
		NC.8.F.2	Compare properties of two linear functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
Functions	3. Slope-Intercept Form	NC.8.F.4.iii	Analyze functions that model linear relationships. • Construct a graph of a linear relationship given an equation in slope-intercept form.
		NC.8.F.4.ii	Analyze functions that model linear relationships. • Write an equation in slope-intercept form to model a linear relationship by determining the rate of change and the initial value, given at least two (x, y) values or a graph.
		NC.8.F.4.i	Analyze functions that model linear relationships. • Understand that a linear relationship can be generalized by y = ms + b.
		NC.8.F.4.iv	Analyze functions that model linear relationships. • Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of the slope and y-intercept of its graph or a table of values.
		NC.8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate quantitative data, interpreting the slope and y-intercept.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	4. Point-Slope Form	NC.8.F.3	Identify linear functions from tables, equations, and graphs.
Geometry	5. Understanding the Pythagorean Theorem	NC.8.G.6	Explain the Pythagorean Theorem and its converse.
	6. Pythagorean Theorem - Hypotenuse 7. Pythagorean Theorem - Legs 8. Pythagorean Theorem - Mixed Problems	NC.8.G.7	Apply the Pythagorean Theorem and its converse to solve real-world and mathematical problems.
	9. Pythagorean Theorem - Distance Formula	NC.8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
		NC.8.G.7	Apply the Pythagorean Theorem and its converse to solve real-world and mathematical problems.
Expressions and Equations	10. Solving Two-Step Equations	NC.3.OA.8	Solve two-step word problems using addition, subtraction, and multiplication, representing problems using equations with a symbol for the unknown number.
		NC.8.EE.7.ii	Solve real-world and mathematical problems by writing and solving equations and inequalities in one variable. • Solve linear equations and inequalities including multi-step equations and inequalities with the same variable on both sides
	11. Solving Equations with the Variable on Both Sides	NC.8.EE.7.ii	Solve real-world and mathematical problems by writing and solving equations and inequalities in one variable. • Solve linear equations and inequalities including multi-step equations and inequalities with the same variable on both sides
	12. Analyzing Solution Sets to Linear Equations with the Variable on Both Sides	NC.8.EE.7.i	Solve real-world and mathematical problems by writing and solving equations and inequalities in one variable. • Recognize linear equations in one variable as having one solution, infinitely many solutions, or no solutions.
	13. Solving a System of Linear Equations Graphically	NC.8.EE.8.ii	Analyze and solve a system of two linear equations in two variables in slope-intercept form. • Solve real-world and mathematical problems leading to systems of linear equations by graphing the equations. Solve simple cases by inspection.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	14. Solving a System of Linear Equations Algebraically 15. Solving a System of Linear Equations - Applications	NC.8.EE.8.i	Analyze and solve a system of two linear equations in two variables in slope-intercept form. • Understand that solutions to a system of two linear equations correspond to the points of intersection of their graphs because the point of intersection satisfies both equations simultaneously.
Geometry	16. Translations 17. Reflections 18. Rotations 19. Composition of Transformations	NC.8.G.3	Describe the effect of dilations about the origin, translations, rotations about the origin in 90 degree increments, and reflections across the x-axis and y-axis on two-dimensional figures using coordinates.
	20. Dilations	NC.8.G.4.iii	Use transformations to define similarity. • Given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
		NC.8.G.4.ii	Use transformations to define similarity. • Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations.
		NC.8.G.3	Describe the effect of dilations about the origin, translations, rotations about the origin in 90 degree increments, and reflections across the x-axis and y-axis on two-dimensional figures using coordinates.
	21. Dilations in the Coordinate Plane	NC.8.G.3	Describe the effect of dilations about the origin, translations, rotations about the origin in 90 degree increments, and reflections across the x-axis and y-axis on two-dimensional figures using coordinates.
	22. Congruence	NC.8.G.2.ii	Use transformations to define congruence. • Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations.
		NC.8.G.2.iii	Use transformations to define congruence. • Given two congruent figures, describe a sequence that exhibits the congruence between them.

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Unit	Imagine Math Lesson	Standard Code	Standards Description
	23. Volume of Cylinders 24. Volume of Pyramids and Cones 25. Volume of Spheres 26. Volume of Composite Solids	NC.8.G.9	Understand how the formulas for the volumes of cones, cylinders, and spheres are related and use the relationship to solve real-world and mathematical problems.
	27. Angles in a Polygon	NC.7.G.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve equations for an unknown angle in a figure.
		NC.8.G.5.iv	Use informal arguments to analyze angle relationships. • Solve real-world and mathematical problems involving angles.
		NC.8.G.5.i	Use informal arguments to analyze angle relationships. • Recognize relationships between interior and exterior angles of a triangle.
	28. Parallel Lines and Transversals	NC.8.G.5.ii	Use informal arguments to analyze angle relationships. • Recognize the relationships between the angles created when parallel lines are cut by a transversal.
Expressions and Equations	29. Understanding Properties of Integer Exponents 30. Applying Properties of Integer Exponents	NC.8.EE.1	Develop and apply the properties of integer exponents to generate equivalent numerical expressions.
	31. Understanding Square and Cube Roots	NC.8.EE.2.i	Use square root and cube root symbols to: • Represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number.
		NC.8.EE.2.ii	Use square root and cube root symbols to: • Evaluate square roots of perfect squares and cube roots of perfect cubes for positive numbers less than or equal to 400.
The Number System	32. Classifying and Ordering Real Numbers	NC.8.NS.1	Understand that every number has a decimal expansion. Building upon the definition of a rational number, know that an irrational number is defined as a non-repeating, non-terminating decimal.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	33. Approximating Values of Irrational Numbers	NC.8.NS.2.i	Use rational approximations of irrational numbers to compare the size of irrational numbers and locate them approximately on a number line. Estimate the value of expressions involving: • Square roots and cube roots to the tenths.
		NC.8.NS.2.ii	Use rational approximations of irrational numbers to compare the size of irrational numbers and locate them approximately on a number line. Estimate the value of expressions involving: • π to the hundredths.
		NC.8.NS.1	Understand that every number has a decimal expansion. Building upon the definition of a rational number, know that an irrational number is defined as a non-repeating, non-terminating decimal.
Expressions and Equations	34. Interpreting Numbers Written in Scientific Notation	NC.8.EE.3	Use numbers expressed in scientific notation to estimate very large or very small quantities and to express how many times as much one is than the other.
	35. Operations with Numbers in Scientific Notation	NC.8.EE.4	Perform multiplication and division with numbers expressed in scientific notation to solve real-world problems, including problems where both decimal and scientific notation are used.
Functions	36. Interpreting Graphs of Real-World Situations	NC.8.F.5.i	Qualitatively analyze the functional relationship between two quantities. • Analyze a graph determining where the function is increasing or decreasing; linear or non-linear.
	37. Introduction to Sketching Graphs of Real-World Situations	NC.8.F.5.ii	Qualitatively analyze the functional relationship between two quantities. • Sketch a graph that exhibits the qualitative features of a real-world function.
Statistics and Probability	38. Comparing Linear and Nonlinear Data	NC.8.SP.2.i	Model the relationship between bivariate quantitative data to: • Informally fit a straight line for a scatter plot that suggests a linear association.
		NC.8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Investigate and describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.8.SP.2.ii	Model the relationship between bivariate quantitative data to: • Informally assess the model fit by judging the closeness of the data points to the line.
	39. Patterns of Association in Data	NC.8.SP.4.i	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. • Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects.
		NC.8.SP.4.ii	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. • Use relative frequencies calculated for rows or columns to describe possible association between the two variables.
Quantities	40. Using Units to Solve Problems	Not applicable	
Creating Equations	41. Writing and Solving Linear Equations in One Variable	NC.M1.A-CED.1	Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.
		NC.M1.A-REI.3	Solve equations and inequalities in one variable.
		NC.M2.A-CED.3	Create equations that describe numbers or relationships. Create systems of linear, quadratic, square root, and inverse variation equations to model situations in context.
		NC.M2.A-CED.1	Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent quadratic, square root, inverse variation, and right triangle trigonometric relationships and use them to solve problems.

High School Math I

NC Mathematics Standard Course of Study

Unit	Imagine Math Lesson	Standard Code	Standards Description
Linear, Quadratic, and Exponential Models	1. Introduction to Nonlinear Models	NC.M1.F-LE.3	Construct and compare linear and exponential models and solve problems. Compare the end behavior of linear, exponential, and quadratic functions using graphs and tables to show that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically.
Seeing Structure in Expressions	2. Interpreting the Structure of Linear and Exponential Expressions	NC.M1.A-SSE.1a	Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. a. Identify and interpret parts of a linear, exponential, or quadratic expression, including terms, factors, coefficients, and exponents.
		NC.M2.A-SSE.1a	Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. a. Identify and interpret parts of a quadratic, square root, inverse variation, or right triangle trigonometric expression, including terms, factors, coefficients, radicands, and exponents.
		NC.M2.A-SSE.1b	Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. b. Interpret quadratic and square root expressions made of multiple parts as a combination of single entities to give meaning in terms of a context.
Creating Equations	3. Writing and Solving Linear Equations in One Variable	NC.M1.A-CED.1	Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.
		NC.M1.A-REI.3	Solve equations and inequalities in one variable.
		NC.M2.A-CED.3	Create equations that describe numbers or relationships. Create systems of linear, quadratic, square root, and inverse variation equations to model situations in context.
		NC.M2.A-CED.1	Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent quadratic, square root, inverse variation, and right triangle trigonometric relationships and use them to solve problems.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	4. Writing and Graphing Linear Equations in Two or More Variables	NC.M1.A-CED.2	Create equations that describe numbers or relationships. Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.
	5. Equations of Parallel and Perpendicular Lines	NC.M2.A-CED.2	Create equations that describe numbers or relationships. Create and graph equations in two variables to represent quadratic, square root and inverse variation relationships between quantities.
	6. Writing Linear Inequalities in One Variable	NC.M1.A-CED.1	Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.
		NC.M2.A-CED.3	Create equations that describe numbers or relationships. Create systems of linear, quadratic, square root, and inverse variation equations to model situations in context.
		NC.M2.A-CED.1	Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent quadratic, square root, inverse variation, and right triangle trigonometric relationships and use them to solve problems.
Reasoning with Equations and Inequalities	7. Solving Linear Inequalities in One Variable	NC.M1.A-REI.3	Solve equations and inequalities in one variable.
Creating Equations	8. Modeling Exponential Relationships with Equations, Inequalities, and Graphs	NC.M1.A-CED.1	Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.
		NC.M1.A-CED.2	Create equations that describe numbers or relationships. Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.
Reasoning with Equations and Inequalities	9. Solving Linear Equations in One Variable as a Reasoning Process	NC.M1.A-REI.1	Understand solving equations as a process of reasoning and explain the reasoning. Justify a chosen solution method and each step of the solving process for linear and quadratic equations using mathematical reasoning.
		NC.M1.A-REI.3	Solve equations and inequalities in one variable.
		NC.M2.A-REI.1	Understand solving equations as a process of reasoning and explain the reasoning. Justify a chosen solution method and each step of the solving process for quadratic, square root and inverse variation equations using mathematical reasoning.

Unit	Imagine Math Lesson	Standard Code	Standards Description
Creating Equations	10. Solving Literal Equations	NC.M1.A-CED.4	Create equations that describe numbers or relationships. Solve for a quantity of interest in formulas used in science and mathematics using the same reasoning as in solving equations.
Reasoning with Equations and Inequalities	11. Solving Systems of Linear Equations	NC.M1.A-REI.5	Solve systems of equations. Explain why replacing one equation in a system of linear equations by the sum of that equation and a multiple of the other produces a system with the same solutions.
		NC.M1.A-REI.6	Solve systems of equations. Use tables, graphs, or algebraic methods (substitution and elimination) to find approximate or exact solutions to systems of linear equations and interpret solutions in terms of a context.
	12. Solving Linear Equations Graphically 13. Solving Exponential Equations Graphically	NC.M1.A-REI.11	Represent and solve equations and inequalities graphically. Build an understanding of why the x-coordinates of the points where the graphs of two linear, exponential, and/or quadratic equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x) and approximate solutions using graphing technology or successive approximations with a table of values.
		NC.M1.A-REI.10	Represent and solve equations and inequalities graphically. Understand that the graph of a two variable equation represents the set of all solutions to the equation.
	14. Graphing Linear Inequalities and Systems of Linear Inequalities in Real-World Situations	NC.M1.A-CED.3	Create equations that describe numbers or relationships. Create systems of linear equations and inequalities to model situations in context.
		NC.M1.A-REI.12	Represent and solve equations and inequalities graphically. Represent the solutions of a linear inequality or a system of linear inequalities graphically as a region of the plane.
		NC.M2.A-CED.3	Create equations that describe numbers or relationships. Create systems of linear, quadratic, square root, and inverse variation equations to model situations in context.

Unit	Imagine Math Lesson	Standard Code	Standards Description
Interpreting Functions	15. Function Notation I 16. Function Notation II	NC.M1.F-IF.2	Understand the concept of a function and use function notation. Use function notation to evaluate linear, quadratic, and exponential functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
		NC.M1.F-IF.1	Understand the concept of a function and use function notation. Build an understanding that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range by recognizing that: • if f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. • the graph of f is the graph of the equation y = f(x).
	17. Interpreting Graphs of Linear and Exponential Functions in Context	NC.M1.F-IF.4	Interpret functions that arise in applications in terms of the context. Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.
		NC.M2.F-IF.4	Interpret functions that arise in applications in terms of the context. Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: domain and range, rate of change, symmetries, and end behavior.
	18. Sketching Graphs of Linear and Exponential Functions from a Context	NC.M1.F-IF.4	Interpret functions that arise in applications in terms of the context. Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.
	19. Understanding the Domain of a Function	NC.M1.F-IF.5	Interpret functions that arise in applications in terms of the context. Interpret a function in terms of the context by relating its domain and range to its graph and, where applicable, to the quantitative relationship it describes.
	20. Rate of Change for Linear and Exponential Functions	NC.M1.F-IF.6	Interpret functions that arise in applications in terms of the context. Calculate and interpret the average rate of change over a specified interval for a function presented numerically, graphically, and/or symbolically.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	21. Sketching Graphs of Linear Functions from Symbolic Representations	NC.M1.F-IF.7	Analyze functions using different representations. Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.
		NC.M2.F-IF.7	Analyze functions using different representations. Analyze quadratic, square root, and inverse variation functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; intercepts; intervals where the function is increasing, decreasing, positive, or negative; rate of change; maximums and minimums; symmetries; and end behavior.
	22. Sketching Graphs of Exponential Functions from Symbolic Representations	NC.M1.A-CED.2	Create equations that describe numbers or relationships. Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.
		NC.M1.F-IF.7	Analyze functions using different representations. Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.
		NC.M2.F-IF.7	Analyze functions using different representations. Analyze quadratic, square root, and inverse variation functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; intercepts; intervals where the function is increasing, decreasing, positive, or negative; rate of change; maximums and minimums; symmetries; and end behavior.
	23. Comparing Functions Using Different Representations	NC.M1.F-IF.9	Analyze functions using different representations. Compare key features of two functions (linear, quadratic, or exponential) each with a different representation (symbolically, graphically, numerically in tables, or by verbal descriptions).
		NC.M2.F-IF.9	Analyze functions using different representations. Compare key features of two functions (linear, quadratic, square root, or inverse variation functions) each with a different representation (symbolically, graphically, numerically in tables, or by verbal descriptions).

Unit	Imagine Math Lesson	Standard Code	Standards Description
Linear, Quadratic, and Exponential Models	24. Distinguishing Between Linear and Exponential Relationships	NC.M1.F-LE.1	Construct and compare linear and exponential models and solve problems. Identify situations that can be modeled with linear and exponential functions, and justify the most appropriate model for a situation based on the rate of change over equal intervals.
Building Functions	25. Writing Linear and Exponential Functions from a Context	NC.M1.F.BF.1a	Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. a. Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (include reading these from a table).
Linear, Quadratic, and Exponential Models	26. Writing Linear and Exponential Functions Based on Different Representations	Not applicable	
Building Functions	27. Composite Functions	NC.M1.F.BF.1b	Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. b. Build a function that models a relationship between two quantities by combining linear, exponential, or quadratic functions with addition and subtraction or two linear functions with multiplication.
	28. Writing Arithmetic Sequences Explicitly and Recursively 29. Writing Geometric Sequences Using an Explicit Formula 30. Writing Geometric Sequences Recursively	NC.M1.F-BF.2	Build a function that models a relationship between two quantities. Translate between explicit and recursive forms of arithmetic and geometric sequences and use both to model situations.
Interpreting Functions	31. Sequences as Functions	NC.MI.F-IF.3	Understand the concept of a function and use function notation. Recognize that recursively and explicitly defined sequences are functions whose domain is a subset of the integers, the terms of an arithmetic sequence are a subset of the range of a linear function, and the terms of a geometric sequence are a subset of the range of an exponential function.
Interpreting Categorical and Quantitative Data	32. Data Displays on the Real Number Line	NC.M1.S-ID.1	Summarize, represent, and interpret data on a single count or measurement variable. Use technology to represent data with plots on the real number line (histograms, and box plots).

Unit	Imagine Math Lesson	Standard Code	Standards Description
	33. Comparing the Shape, Center, and Spread of Data Sets	NC.M1.S-ID.3	Summarize, represent, and interpret data on a single count or measurement variable. Examine the effects of extreme data points (outliers) on shape, center, and/or spread.
		NC.M1.S-ID.2	Summarize, represent, and interpret data on a single count or measurement variable. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets. Interpret differences in shape, center, and spread in the context of the data sets.
	34. Fitting Functions to Data	NC.M1.S-ID.6c	Summarize, represent, and interpret data on two categorical and quantitative variables. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. c. Fit a function to exponential data using technology. Use the fitted function to solve problems.
		NC.M1.S-ID.6a	Summarize, represent, and interpret data on two categorical and quantitative variables. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a least squares regression line to linear data using technology. Use the fitted function to solve problems.
		NC.M1.S-ID.6b	Summarize, represent, and interpret data on two categorical and quantitative variables. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. b. Assess the fit of a linear function by analyzing residuals.
	35. Correlation	NC.M1.S-ID.7	Interpret linear models. Interpret in context the rate of change and the intercept of a linear model. Use the linear model to interpolate and extrapolate predicted values. Assess the validity of a predicted value.
		NC.M1.S-ID.9	Interpret linear models. Distinguish between association and causation.

Unit	Imagine Math Lesson	Standard Code	Standards Description
Arithmetic with Polynomials and Rational Expressions	36. Adding and Subtracting Polynomials 37. Multiplying Polynomials	NC.M1.A-APR.1	Perform arithmetic operations on polynomials. Build an understanding that operations with polynomials are comparable to operations with integers by adding and subtracting quadratic expressions and by adding, subtracting, and multiplying linear expressions.
		NC.M2.A-APR.1	Perform arithmetic operations on polynomials. Extend the understanding that operations with polynomials are comparable to operations with integers by adding, subtracting, and multiplying polynomials.
Interpreting Functions	38. Rewriting and Interpreting Exponential Functions in Terms of Context	NC.M1.A-SSE.1b	Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. b. Interpret a linear, exponential, or quadratic expression made of multiple parts as a combination of entities to give meaning to an expression.
		NC.M1.F-IF.8b	Analyze functions using different representations. Use equivalent expressions to reveal and explain different properties of a function. b. Interpret and explain growth and decay rates for an exponential function.
		NC.M1.F-LE.5	Interpret expressions for functions in terms of the situation they model. Interpret the parameters a and b in a linear function $f(x) = ax + b$ or an exponential function $g(x) = ab$ in terms of a context.
		NC.M2.A-SSE.3	Interpret the structure of expressions. Write an equivalent form of a quadratic expression by completing the square, where a is an integer of a quadratic expression, $ax^2 + bx + c$, to reveal the maximum or minimum value of the function the expression defines.
Seeing Structure in Expressions	39. Interpreting the Structure of Quadratic Expressions and Expressions with Rational Exponents	NC.M1.A-SSE.1a	Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. a. Identify and interpret parts of a linear, exponential, or quadratic expression, including terms, factors, coefficients, and exponents.
		NC.M2.A-SSE.1a	Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. a. Identify and interpret parts of a quadratic, square root, inverse variation, or right triangle trigonometric expression, including terms, factors, coefficients, radicands, and exponents.

Unit	Imagine Math Lesson	Standard Code	Standards Description
Creating Equations	40. Modeling Quadratic Relationships with Equations, Inequalities, and Graphs	NC.M1.A-CED.1	Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.
		NC.M1.A-CED.2	Create equations that describe numbers or relationships. Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.
		NC.M1.A-CED.4	Create equations that describe numbers or relationships. Solve for a quantity of interest in formulas used in science and mathematics using the same reasoning as in solving equations.
		NC.M2.A-CED.2	Create equations that describe numbers or relationships. Create and graph equations in two variables to represent quadratic, square root and inverse variation relationships between quantities.
		NC.M2.A-CED.1	Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent quadratic, square root, inverse variation, and right triangle trigonometric relationships and use them to solve problems.
Building Functions	41. Writing Quadratic Functions from a Context	NC.M1.F.BF.1a	Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. a. Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (include reading these from a table).
		NC.M1.F.BF.1b	Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. b. Build a function that models a relationship between two quantities by combining linear, exponential, or quadratic functions with addition and subtraction or two linear functions with multiplication.
		NC.M2.A-SSE.1b	Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. b. Interpret quadratic and square root expressions made of multiple parts as a combination of single entities to give meaning in terms of a context.

Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.M2.F-BF.1	Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities by building quadratic functions with real solution(s) and inverse variation functions given a graph, a description of a relationship, or ordered pairs (include reading these from a table).
Seeing Structure in Expressions	42. Factoring Quadratic Expressions	NC.M1.A-APR.3	Understand the relationship between zeros and factors of polynomials. Understand the relationships among the factors of a quadratic expression, the solutions of a quadratic equation, and the zeros of a quadratic function.
		NC.M1.A-REI.4	Solve equations and inequalities in one variable. Solve for the real solutions of quadratic equations in one variable by taking square roots and factoring.
		NC.M1.A-SSE.3	Write expressions in equivalent forms to solve problems. Write an equivalent form of a quadratic expression $ax^2 + bx + c$, where a is an integer, by factoring to reveal the solutions of the equation or the zeros of the function the expression defines.
		NC.M2.A-SSE.3	Interpret the structure of expressions. Write an equivalent form of a quadratic expression by completing the square, where a is an integer of a quadratic expression, $ax^2 + bx + c$, to reveal the maximum or minimum value of the function the expression defines.
Interpreting Functions	43. Sketching Graphs of Quadratic Functions in Context	NC.M1.F-IF.6	Interpret functions that arise in applications in terms of the context. Calculate and interpret the average rate of change over a specified interval for a function presented numerically, graphically, and/or symbolically.
		NC.M1.F-IF.5	Interpret functions that arise in applications in terms of the context. Interpret a function in terms of the context by relating its domain and range to its graph and, where applicable, to the quantitative relationship it describes.
		NC.M1.F-IF.4	Interpret functions that arise in applications in terms of the context. Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.
		NC.M2.F-IF.4	Interpret functions that arise in applications in terms of the context. Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: domain and range, rate of change, symmetries, and end behavior.

Unit	Imagine Math Lesson	Standard Code	Standards Description
Expressing Geometric Properties with Equations	44. Coordinates of Parallel and Perpendicular Lines	NC.M1.G-GPE.5	Use coordinates to prove simple geometric theorems algebraically. Use coordinates to prove the slope criteria for parallel and perpendicular lines and use them to solve problems. • Determine if two lines are parallel, perpendicular, or neither. • Find the equation of a line parallel or perpendicular to a given line that passes through a given point.
		NC.M1.G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. Use coordinates to solve geometric problems involving polygons algebraically. • Use coordinates to compute perimeters of polygons and areas of triangles and rectangles. • Use coordinates to verify algebraically that a given set of points produces a particular type of triangle or quadrilateral.
	45. Problem Solving with Coordinates of Parallel and Perpendicular Lines	NC.M1.G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. Use coordinates to solve geometric problems involving polygons algebraically. • Use coordinates to compute perimeters of polygons and areas of triangles and rectangles. Use coordinates to verify algebraically that a given set of points produces a particular type of triangle or quadrilateral.
	46. Dividing a Segment Proportionally	NC.M1.G-GPE.6	Use coordinates to prove simple geometric theorems algebraically. Use coordinates to find the midpoint or endpoint of a line segment.
	47. Using Coordinates to Find Perimeters and Areas	NC.M1.G-GPE.4	Use coordinates to prove simple geometric theorems algebraically. Use coordinates to solve geometric problems involving polygons algebraically. • Use coordinates to compute perimeters of polygons and areas of triangles and rectangles. Use coordinates to verify algebraically that a given set of points produces a particular type of triangle or quadrilateral.

High School Math II

NC Mathematics Standard Course of Study

Unit	Imagine Math Lesson	Standard Code	Standards Description
Arithmetic with Polynomials and Rational Expressions	1. Adding and Subtracting Polynomials 2. Multiplying Polynomials	NC.M1.A-APR.1	Perform arithmetic operations on polynomials. Build an understanding that operations with polynomials are comparable to operations with integers by adding and subtracting quadratic expressions and by adding, subtracting, and multiplying linear expressions.
		NC.M2.A-APR.1	Perform arithmetic operations on polynomials. Extend the understanding that operations with polynomials are comparable to operations with integers by adding, subtracting, and multiplying polynomials.
The Complex Number System	3. Complex Number Arithmetic	NC.M2.N-CN.1	Defining complex numbers. Know there is a complex number i such that $i^2 = -1$, and every complex number has the form a + bi where a and b are real numbers.
The Real Number System	4. Products and Sums with Rational and Irrational Numbers	NC.M2.N-RN.3	Use properties of rational and irrational numbers. Use the properties of rational and irrational numbers to explain why: • the sum or product of two rational numbers is rational;
	5. Using Rational Exponents to Rewrite Expressions	NC.M2.N-RN.1	Extend the properties of exponents to rational exponents. Explain how expressions with rational exponents can be rewritten as radical expressions.
		NC.M2.N-RN.2	Extend the properties of exponents to rational exponents. Rewrite expressions with radicals and rational exponents into equivalent expressions using the properties of exponents.
Seeing Structure in Expressions	6. Interpreting the Structure of Quadratic Expressions and Expressions with Rational Exponents	NC.M1.A-SSE.1a	Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. a. Identify and interpret parts of a linear, exponential, or quadratic expression, including terms, factors, coefficients, and exponents.
		NC.M2.A-SSE.1a	Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. a. Identify and interpret parts of a quadratic, square root, inverse variation, or right triangle trigonometric expression, including terms, factors, coefficients, radicands, and exponents.
Creating Equations	7. Modeling Quadratic Relationships with Equations, Inequalities, and Graphs	NC.M1.A-CED.1	Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent linear, exponential, and quadratic relationships and use them to solve problems.
		NC.M1.A-CED.2	Create equations that describe numbers or relationships. Create and graph equations in two variables to represent linear, exponential, and quadratic relationships between quantities.

Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.M1.A-CED.4	Create equations that describe numbers or relationships. Solve for a quantity of interest in formulas used in science and mathematics using the same reasoning as in solving equations.
		NC.M2.A-CED.2	Create equations that describe numbers or relationships. Create and graph equations in two variables to represent quadratic, square root and inverse variation relationships between quantities.
		NC.M2.A-CED.1	Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent quadratic, square root, inverse variation, and right triangle trigonometric relationships and use them to solve problems.
Building Functions	8. Writing Quadratic Functions from a Context	NC.M1.F.BF.1a	Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. a. Build linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two ordered pairs (include reading these from a table).
		NC.M1.F.BF.1b	Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. b. Build a function that models a relationship between two quantities by combining linear, exponential, or quadratic functions with addition and subtraction or two linear functions with multiplication.
		NC.M2.A-SSE.1b	Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. b. Interpret quadratic and square root expressions made of multiple parts as a combination of single entities to give meaning in terms of a context.
		NC.M2.F-BF.1	Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities by building quadratic functions with real solution(s) and inverse variation functions given a graph, a description of a relationship, or ordered pairs (include reading these from a table).

Unit	Imagine Math Lesson	Standard Code	Standards Description
Interpreting Functions	9. Sketching Graphs of Quadratic Functions in Context	NC.M1.F-IF.6	Interpret functions that arise in applications in terms of the context. Calculate and interpret the average rate of change over a specified interval for a function presented numerically, graphically, and/or symbolically.
		NC.M1.F-IF.5	Interpret functions that arise in applications in terms of the context. Interpret a function in terms of the context by relating its domain and range to its graph and, where applicable, to the quantitative relationship it describes.
		NC.M1.F-IF.4	Interpret functions that arise in applications in terms of the context. Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums.
		NC.M2.F-IF.4	Interpret functions that arise in applications in terms of the context. Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: domain and range, rate of change, symmetries, and end behavior.
	10. Sketching and Transforming Graphs of Quadratic Functions from Symbolic Representations	NC.M1.F-IF.7	Analyze functions using different representations. Analyze linear, exponential, and quadratic functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; rate of change; intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; and end behavior.
		NC.M2.F-BF.3	Build new functions from existing functions. Understand the effects of the graphical and tabular representations of a linear, quadratic, square root, and inverse variation function f with k – f(x), f(x) + k, f(x + k) for specific values of k (both positive and negative).
		NC.M2.F-IF.7	Analyze functions using different representations. Analyze quadratic, square root, and inverse variation functions by generating different representations, by hand in simple cases and using technology for more complicated cases, to show key features, including: domain and range; intercepts; intervals where the function is increasing, decreasing, positive, or negative; rate of change; maximums and minimums; symmetries; and end behavior.

Unit	Imagine Math Lesson	Standard Code	Standards Description
Reasoning with Equations and Inequalities	11. Solving Quadratic Equations with Real and Complex Roots - Completing the Square	NC.M2.A-REI.4a	Solve equations and inequalities in one variable. Solve for all solutions of quadratic equations in one variable. a. Understand that the quadratic formula is the generalization of solving $ax^2 + bx + c$ by using the process of completing the square.
		NC.M2.A-REI.1	Understand solving equations as a process of reasoning and explain the reasoning. Justify a chosen solution method and each step of the solving process for quadratic, square root and inverse variation equations using mathematical reasoning.
Interpreting Functions	12. Rewriting Quadratics to Reveal Their Structure	NC.M1.A-SSE.3	Write expressions in equivalent forms to solve problems. Write an equivalent form of a quadratic expression $ax^2 + bx + c$, where a is an integer, by factoring to reveal the solutions of the equation or the zeros of the function the expression defines.
		NC.M1.F-IF.8a	Analyze functions using different representations. Use equivalent expressions to reveal and explain different properties of a function. a. Rewrite a quadratic function to reveal and explain different key features of the function.
		NC.M2.A-SSE.3	Interpret the structure of expressions. Write an equivalent form of a quadratic expression by completing the square, where a is an integer of a quadratic expression, $ax^2 + bx + c$, to reveal the maximum or minimum value of the function the expression defines.
		NC.M2.F-IF.8	Analyze functions using different representations. Use equivalent expressions to reveal and explain different properties of a function by developing and using the process of completing the square to identify the zeros, extreme values, and symmetry in graphs and tables representing quadratic functions, and interpret these in terms of a context.
	13. Comparing Functions Using Different Representations II	NC.M1.F-IF.9	Analyze functions using different representations. Compare key features of two functions (linear, quadratic, or exponential) each with a different representation (symbolically, graphically, numerically in tables, or by verbal descriptions).
		NC.M1.N-RN.2	Extend the properties of exponents to rational exponents. Rewrite algebraic expressions with integer exponents using the properties of exponents.
		NC.M2.F-IF.9	Analyze functions using different representations. Compare key features of two functions (linear, quadratic, square root, or inverse variation functions) each with a different representation (symbolically, graphically, numerically in tables, or by verbal descriptions).

Unit	Imagine Math Lesson	Standard Code	Standards Description
Reasoning with Equations and Inequalities	14. Problem Solving with Quadratic Functions 15. Solving Quadratic Equations with Real and Complex Roots - Using the Quadratic Formula	NC.M2.A-REI.4b	Solve equations and inequalities in one variable. Solve for all solutions of quadratic equations in one variable. b. Explain when quadratic equations will have non-real solutions and express complex solutions as $a \pm bi$ for real numbers a and b.
		NC.M2.A-REI.4a	Solve equations and inequalities in one variable. Solve for all solutions of quadratic equations in one variable. a. Understand that the quadratic formula is the generalization of solving $ax^2 + bx + c$ by using the process of completing the square.
	16. Solving a System of Linear and Quadratic Equations	NC.M2.A-REI.7	Solve systems of equations. Use tables, graphs, and algebraic methods to approximate or find exact solutions of systems of linear and quadratic equations, and interpret the solutions in terms of a context.
	17. Solving Quadratic Equations Graphically	NC.M1.A-REI.10	Represent and solve equations and inequalities graphically. Understand that the graph of a two variable equation represents the set of all solutions to the equation.
Congruence	18. Defining Transformations	NC.M2.G-CO.4	Experiment with transformations in the plane. Verify experimentally properties of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
	19. Rotational and Reflectional Symmetry	NC.M2.G-CO.3	Experiment with transformations in the plane. Given a triangle, quadrilateral, or regular polygon, describe any reflection or rotation symmetry i.e., actions that carry the figure onto itself. Identify center and angle(s) of rotation symmetry. Identify line(s) of reflection symmetry.
	20. Representing Transformations with Algebra	NC.M2.F-IF.1	Understand the concept of a function and use function notation. Extend the concept of a function to include geometric transformations in the plane by recognizing that: • the domain and range of a transformation function f are sets of points in the plane; • the image of a transformation is a function of its pre-image.

Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.M2.G-CO.2	Experiment with transformations in the plane. Experiment with transformations in the plane. • Represent transformations in the plane. • Compare rigid motions that preserve distance and angle measure (translations, reflections, rotations) to transformations that do not preserve both distance and angle measure (e.g. stretches, dilations). • Understand that rigid motions produce congruent figures while dilations produce similar figures.
	21. Rigid Motion and Congruence	NC.M2.G-CO.6	Understand congruence in terms of rigid motions. Determine whether two figures are congruent by specifying a rigid motion or sequence of rigid motions that will transform one figure onto the other.
		NC.M2.G-CO.5	Experiment with transformations in the plane. Given a geometric figure and a rigid motion, find the image of the figure. Given a geometric figure and its image, specify a rigid motion or sequence of rigid motions that will transform the pre-image to its image.
	22. What Is Proof?	NC.M2.G-CO.7	Understand congruence in terms of rigid motions. Use the properties of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
		NC.M2.G-CO.9	Prove geometric theorems. Prove theorems about lines and angles and use them to prove relationships in geometric figures including: • Vertical angles are congruent. • When a transversal crosses parallel lines, alternate interior angles are congruent. • When a transversal crosses parallel lines, corresponding angles are congruent. • Points are on a perpendicular bisector of a line segment if and only if they are equidistant from the endpoints of the segment. Use congruent triangles to justify why the bisector of an angle is equidistant from the sides of the angle.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	23. Proving Theorems About Lines and Angles	NC.M2.G-CO.9	Prove geometric theorems. Prove theorems about lines and angles and use them to prove relationships in geometric figures including: • Vertical angles are congruent. • When a transversal crosses parallel lines, alternate interior angles are congruent. • When a transversal crosses parallel lines, corresponding angles are congruent. • Points are on a perpendicular bisector of a line segment if and only if they are equidistant from the endpoints of the segment. Use congruent triangles to justify why the bisector of an angle is equidistant from the sides of the angle.
	24. Proving Theorems About Congruent Triangles	NC.M2.G-CO.8	Understand congruence in terms of rigid motions. Use congruence in terms of rigid motion. Justify the ASA, SAS, and SSS criteria for triangle congruence. Use criteria for triangle congruence (ASA, SAS, SSS, HL) to determine whether two triangles are congruent.
		NC.M2.G-CO.10	Prove geometric theorems. Prove theorems about triangles and use them to prove relationships in geometric figures including: • The sum of the measures of the interior angles of a triangle is 180°. • An exterior angle of a triangle is equal to the sum of its remote interior angles. • The base angles of an isosceles triangle are congruent. • The segment joining the midpoints of two sides of a triangle is parallel to the third side and half the length.
Similarity, Right Triangles, and Trigonometry	25. Problem Solving with Congruent Triangles	NC.M2.G-CO.10	Prove geometric theorems. Prove theorems about triangles and use them to prove relationships in geometric figures including: • The sum of the measures of the interior angles of a triangle is 180°. • An exterior angle of a triangle is equal to the sum of its remote interior angles. • The base angles of an isosceles triangle are congruent. The segment joining the midpoints of two sides of a triangle is parallel to the third side and half the length.

Unit	Imagine Math Lesson	Standard Code	Standards Description
Congruence	26. Proving Theorems About Relationships in Triangles	NC.M2.G-CO.10	Prove geometric theorems. Prove theorems about triangles and use them to prove relationships in geometric figures including: • The sum of the measures of the interior angles of a triangle is 180°. • An exterior angle of a triangle is equal to the sum of its remote interior angles. • The base angles of an isosceles triangle are congruent. The segment joining the midpoints of two sides of a triangle is parallel to the third side and half the length.
	27. Proving Theorems About Parallelograms	NC.M2.G-CO.9	Prove geometric theorems. Prove theorems about lines and angles and use them to prove relationships in geometric figures including: • Vertical angles are congruent. • When a transversal crosses parallel lines, alternate interior angles are congruent. • When a transversal crosses parallel lines, corresponding angles are congruent. • Points are on a perpendicular bisector of a line segment if and only if they are equidistant from the endpoints of the segment. • Use congruent triangles to justify why the bisector of an angle is equidistant from the sides of the angle.
Similarity, Right Triangles, and Trigonometry	28. Properties of Dilations I	NC.M2.G-SRT.1c	Understand similarity in terms of similarity transformations. Verify experimentally the properties of dilations with given center and scale factor: c. The distance between the center of a dilation and any point on the image is equal to the scale factor multiplied by the distance between the dilation center and the corresponding point on the pre-image.
		NC.M2.G-SRT.1b	Understand similarity in terms of similarity transformations. Verify experimentally the properties of dilations with given center and scale factor: b. The length of the image of a line segment is equal to the length of the line segment multiplied by the scale factor.
	29. Properties of Dilations II	NC.M2.G-SRT.1d	Understand similarity in terms of similarity transformations. Verify experimentally the properties of dilations with given center and scale factor: d. Dilations preserve angle measure.

Unit	Imagine Math Lesson	Standard Code	Standards Description
		NC.M2.G-SRT.1a	Understand similarity in terms of similarity transformations. Verify experimentally the properties of dilations with given center and scale factor: a. When a line segment passes through the center of dilation, the line segment and its image lie on the same line. When a line segment does not pass through the center of dilation, the line segment and its image are parallel.
	30. Transformations and Similarity	NC.M2.G-SRT.2	Understand similarity in terms of similarity transformations. Understand similarity in terms of transformations. a. Determine whether two figures are similar by specifying a sequence of transformations that will transform one figure into the other. b. Use the properties of dilations to show that two triangles are similar when all corresponding pairs of sides are proportional and all corresponding pairs of angles are congruent.
		NC.M2.G-SRT.3	Understand similarity in terms of similarity transformations. Use transformations (rigid motions and dilations) to justify the AA criterion for triangle similarity.
	31. Problem Solving with Transformations and Similarity	NC.M2.G-SRT.4	Prove theorems involving similarity. Use similarity to solve problems and to prove theorems about triangles. Use theorems about triangles to prove relationships in geometric figures. • A line parallel to one side of a triangle divides the other two sides proportionally and its converse. • The Pythagorean Theorem
Geometry	32. Pythagorean Theorem - Hypotenuse 33. Pythagorean Theorem - Legs 34. Pythagorean Theorem - Mixed Problems	NC.8.G.7	Apply the Pythagorean Theorem and its converse to solve real-world and mathematical problems.
Similarity, Right Triangles, and Trigonometry	35. Proving Theorems About Similar Triangles	NC.M2.G-SRT.4	Prove theorems involving similarity. Use similarity to solve problems and to prove theorems about triangles. Use theorems about triangles to prove relationships in geometric figures. • A line parallel to one side of a triangle divides the other two sides proportionally and its converse. The Pythagorean Theorem

Unit	Imagine Math Lesson	Standard Code	Standards Description
	36. Similarity and Trigonometric Ratios	NC.M2.G-SRT.6	Define trigonometric ratios and solve problems involving right triangles. Verify experimentally that the side ratios in similar right triangles are properties of the angle measures in the triangle, due to the preservation of angle measure in similarity. Use this discovery to develop definitions of the trigonometric ratios for acute angles.
	37. Problem Solving with Similarity and Trigonometric Ratios	NC.M2.G-SRT.4	Prove theorems involving similarity. Use similarity to solve problems and to prove theorems about triangles. Use theorems about triangles to prove relationships in geometric figures. • A line parallel to one side of a triangle divides the other two sides proportionally and its converse. The Pythagorean Theorem
		NC.M2.G-SRT.8	Define trigonometric ratios and solve problems involving right triangles. Use trigonometric ratios and the Pythagorean Theorem to solve problems involving right triangles in terms of a context.
Conditional Probability and the Rules of Probability	38. Organizing Possible Outcomes of Events	NC.M2.S-CP.1	Understand independence and conditional probability and use them to interpret data. Describe events as subsets of the outcomes in a sample space using characteristics of the outcomes or as unions, intersections and complements of other events.
	39. Using Area Models for Compound Probability	NC.M2.S-CP.5	Understand independence and conditional probability and use them to interpret data. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.
	40. Understanding Independent and Dependent Events	NC.M2.S-CP.3b	Understand independence and conditional probability and use them to interpret data. Develop and understand independence and conditional probability. b. Understand that event A is independent from event B if the probability of event A does not change in response to the occurrence of event B. That is P(A|B)=P(A).
		NC.M2.S-CP.3a	Understand independence and conditional probability and use them to interpret data. Develop and understand independence and conditional probability. a. Use a 2-way table to develop understanding of the conditional probability of A given B (written P(A|B)) as the likelihood that A will occur given that B has occurred. That is, P(A|B) is the fraction of event B's outcomes that also belong to event A.

Unit	Imagine Math Lesson	Standard Code	Standards Description
	41. Understanding Conditional Probability	NC.M2.S-CP.3b	Understand independence and conditional probability and use them to interpret data. Develop and understand independence and conditional probability. b. Understand that event A is independent from event B if the probability of event A does not change in response to the occurrence of event B. That is P(A|B)=P(A).
		NC.M2.S-CP.6	Use the rules of probability to compute probabilities of compound events in a uniform probability model. Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in context.
	42. Modeling Probability Situations Using Two-Way Frequency Tables	NC.M2.S-CP.4	Understand independence and conditional probability and use them to interpret data. Represent data on two categorical variables by constructing a two-way frequency table of data. Interpret the two-way table as a sample space to calculate conditional, joint and marginal probabilities. Use the table to decide if events are independent.
		NC.M2.S-CP.3a	Understand independence and conditional probability and use them to interpret data. Develop and understand independence and conditional probability. a. Use a 2-way table to develop understanding of the conditional probability of A given B (written P(A|B)) as the likelihood that A will occur given that B has occurred. That is, P(A|B) is the fraction of event B's outcomes that also belong to event A.
		NC.M2.S-CP.6	Use the rules of probability to compute probabilities of compound events in a uniform probability model. Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in context.
	43. Relating Probabilities of Unions and Intersections of Events	NC.M2.S-CP.7	Use the rules of probability to compute probabilities of compound events in a uniform probability model. Apply the Addition Rule, P(A or B) = P(A) + P(B) - P(A and B), and interpret the answer in context.

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