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Placement Grade	CCSS	Lesson Title	Lesson Description
K, 1, 2	K.OA.A.2 K.OA.A.4	Addition and Subtraction within 10 Using Models	Add and subtract whole numbers with sums and minuends less than or equal to 10 using models; find the number that makes 10 when added to a given number.
K, 1, 2	1.OA.D.8	Addition and Subtraction as Inverse Operations	Apply the inverse relationship between addition and subtraction to solve one-step equations and to model and solve real-world problems.
K, 1, 2	2.OA.A.1	Using Addition and Subtraction to Make Comparisons	Solve addition and subtraction problems involving comparison.
K, 1, 2	1.OA.C.6	Addition and Subtraction: Fact Fluency	Use mental strategies to add and subtract two whole numbers within 20 that do not involve regrouping in order to increase fact fluency.
K, 1, 2	1.NBT.A.1 1.NBT.B.2	Modeling and Comparing Numbers to 120	Model whole numbers to 120, and relate them to their standard form; use place value to determine the digit value; compare and order numbers up to 120.
K, 1, 2	2.NBT.A.3	The Place Value System of Whole Numbers	Model whole numbers to the thousands place, and relate models to the standard form; use place value to determine a digit's value based on its position through thousands.
K, 1, 2	2.NBT.A.4	Composing, Decomposing, and Ordering Numbers Using Place Value	Compare and order numbers to the millions, and write whole numbers to the millions in standard, word, and expanded forms.
K, 1, 2	2.NBT.B.5 2.NBT.B.6	Addition and Subtraction within 100	Add and subtract whole numbers with sums and minuends less than or equal to 100 using models and place-value strategies, without regrouping.
K, 1, 2	3.OA.A.1 3.OA.A.2 3.OA.A.3	Multiplication and Division: Repeated Addition and Subtraction	Use the inverse relationship between multiplication and division to find missing numbers in number sentences and basic one-step equations, including real-world problems.

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3, 4, 5	3.G.A.1 4.G.A.2 4.G.A.3 5.G.B.3 5.G.B.4	Attributes and Classification of Figures	Classify angles (right, acute, obtuse) and lines (perpendicular, parallel) in two-dimensional figures; classify quadrilaterals based on their attributes and properties; identify lines of symmetry.
3, 4, 5	3.MD.C.5.A 3.MD.C.5.B 3.MD.C.6 4.MD.A.3 5.MD.C.3.A 5.MD.C.3.B 5.MD.C.4	Perimeter, Area, and Volume: Concepts and Units	Express perimeter, area, and volume using appropriate measurements; determine which kind of measurement is appropriate for a given real-world situation.
3, 4, 5	3.MD.C.7.C 3.MD.D.8 4.MD.A.3 5.MD.C.5.A 5.MD.C.5.B	Perimeter, Area, and Volume: Calculations	Calculate perimeter and area of rectangles and volume of rectangular solids, including real-world problems.
3	3.OA.A.3	Multiplication and Division: Arrays and Remainders	Calculate basic multiplication problems and division problems not involving remainders using rectangular arrays.
3	3.OA.A.1 3.OA.A.2	Multiplication and Division: Equal Groups	Model multiplication and division problems using equal groups, and relate back to repeated addition and subtraction; solve real-world problems involving equal groups not naturally occurring in an array-like form that can be solved using multiplication and division.
3	3.MD.C.7.A 3.MD.C.7.B	Connecting Area and Multiplication	Use area models to represent multiplication; find the area of a rectangle by multiplying the side lengths.
3	3.MD.C.7.C 3.MD.C.7.D	Decomposing Shapes to Find Area	Find area by decomposing composite shapes into rectangles and adding the areas; use area models to represent the distributive property.

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3	3.OA.A.4	Unknowns in Multiplication and Division Equations	Determine the unknown whole number in multiplication and division equations relating three whole numbers.
3	3.OA.A.4	Using Multiplication and Division to Make Comparisons	Use multiplication and division to make comparisons, and interpret a multiplication or division equation in terms of size comparisons; solve real-world problems involving comparisons using all four operations.
3	3.OA.A.3	The Four Operations: Summary and Word Problems	Create real-world contexts for expressions involving two whole numbers and a single operation; use both keywords and an understanding of the context in word problems to choose the right mathematical operation.
3	3.OA.A.1 3.OA.A.2	Multiplication and Division: Fact Fluency	Use mental strategies to multiply and divide two whole numbers within 100 to increase fact fluency; solve real-world problems quickly using fact fluency.
3	3.NBT.A.2	Multi-Digit Addition	Apply the standard algorithm for adding multi-digit whole numbers and use various grouping strategies for mental addition with sums within 1,000, including real-world problems.
3	3.NBT.A.2	Multi-Digit Subtraction	Apply the standard algorithm and use various grouping strategies to accurately subtract whole numbers within 1,000, including real-world problems.
3	3.OA.D.8	Multistep Word Problems	Solve real-world problems with two operations involving whole numbers.
3	3.NF.A.1	Visual Models of Fractions	Compare fractions with the same denominator using visual models, including real-world problems; relate a fraction to its visual representation as a circle diagram in both directions or a fraction bar in both directions, explaining the role of the numerator and denominator.
3	3.NF.A.1.2.A 3.NF.A.1.2.B	Fractions on the Number Line	Compare fractions with the same denominator using the number line, including real-world problems; represent fractions on a number line.

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3	3.NF.A.1	Fractions as Parts of a Total	Compare two fractions with the same denominator by comparing different parts of the same set, and describe sets as wholes and fractions as representations of parts of that set; use fractions to represent real-world parts of a set, and compare different parts of the set.
3	3.NF.A.3.A 3.NF.A.3.B 3.NF.A.3.C	Equivalent Fractions and Comparing	Identify equivalent fractions using number lines; express whole numbers as fractions, and recognize fractions that are equivalent to 1; compare two fractions with the same numerator or denominator.
4	4.MD.A.1 4.MD.A.2	Problem Solving within Measurement Systems	Know relative sizes of measurement units within one system of units; solve word problems involving distances, time, liquid volumes, and masses of objects.
4	4.OA.B.4	Factors and Multiples	Describe numbers according to their characteristics (factors, multiples, prime, and composite); solve real-world problems to find factors or multiples.
4	4.NBT.A.2	Place Value Concepts up to 1,000,000,000	Identify the value of a digit in whole numbers through 1,000,000,000; write whole numbers through 1,000,000,000 in expanded and word forms; compare two whole numbers through 1,000,000,000.
4	4.NBT.A.3	The Number Line and Rounding Numbers	Round numbers using a given number line; use standard rules to round multi-digit numbers to a given place value; use rounding in real-world situations.
4	4.NBT.B.5	Multi-Digit Multiplication	Apply the standard algorithm and various grouping strategies for multiplying multi-digit whole numbers, including real-world problems.
4	4.NBT.B.6	Multi-Digit Division Using Area Models	Divide numbers up to four digits by a one-digit number using an area model.
4	4.OA.A.3	Multistep Real-World Problems with Whole Number Operations	Identify a set of equations or steps that can be used to solve a word problem containing whole numbers, including multistep problems in which remainders must be interpreted.
4	4.OA.A.1 4.OA.A.2	Using Multiplication and Division to Solve Comparison Word Problems	Represent verbal statements of multiplicative comparisons as multiplication equations; solve word problems involving multiplicative comparisons using equations.

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4	4.NF.A.1	Equivalent Fractions	Generate equivalent fractions, including those in which either the numerator or denominator is already given; apply the concept to real-world problems.
4	4.NF.B.4.A 4.NF.B.4.B	Improper Fractions and Mixed Numbers	Find equivalence between mixed numbers and improper fractions; write mixed numbers and improper fractions based on visual models; solve word problems involving mixed numbers.
4	4.NF.A.2	Benchmark Fractions	Choose the benchmark nearest a given fraction; compare a fraction to a benchmark, including finding equivalent fractions; may include real-world problems.
4	4.NF.A.2	Comparing Fractions via Benchmark Fractions	Use benchmark fractions to compare fractions and to order 3 or more fractions; compare and order real-world measurements using a benchmark.
4	4.NF.A.2	Using Equivalent Fractions to Compare Fractions	Compare two fractions with different denominators; compare two fractions with different denominators including at least one mixed number; order three or more fractions with different denominators, including those with at least one mixed number; rewrite fractions to have a common denominator.
4	4.NF.B.3.C 4.NF.B.3.D	Adding and Subtracting Fractions	Find an equivalent form of a computed sum or difference, including lowest terms; model and compute sums and differences of fractions when the denominator is the same, including real-world problems.
4	4.NF.B.3.C 4.NF.B.3.D	Adding and Subtracting Mixed Numbers with Like Denominators	Add and subtract mixed numbers with like denominators, including real-world problems.
4	4.NF.C.5 4.NF.C.6 4.NF.C.7	Working with Fractions with Denominators of 10 and 100	Add two fractions with denominators 10 and 100 using a common denominator; write fractions with denominators 10 or 100 as decimals and vice versa.
4	4.NF.B.4.A 4.NF.B.4.B 4.NF.B.4.C	Multiplying a Fraction by a Whole Number	Multiply a fraction by a whole number and vice versa; solve real-world problems involving a fraction of a total using multiplication (both unit fractions and otherwise).

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4	4.NF.C.6	Place Value and Decimals to Hundredths	Model and compare decimals to hundredths; plot and name decimals to hundredths on the number line.
5	5.NF.B.7	Unit Fractions and Whole Number Division	Divide a unit fraction by a whole number and vice versa; use unit fraction and whole number division to solve real-world problems.
5	5.MD.A.1	Converting Measurements	Convert measures within both metric and customary systems to solve mathematical and real-world problems.
5	5.NF.B.6	Multistep Word Problems with Fractions and Decimals	Solve real-world problems with two operations involving fractions and/or decimals.
5	5.NBT.B.7 5.NF.A.1	Using a Calculator with Fractions and Decimals	Use estimation and number sense strategies for checking the output of a calculator computation involving fractions and/or decimals; determine an error in a calculator entry dealing with order of operations involving fractions and/or decimals.
5	5.NBT.A.1 5.NBT.A.2	Multiplying with Powers of 10	Multiply whole numbers by powers of 10 using place value strategies, including real-world problems and mental multiplication.
5	5.NBT.A.2	Dividing with Powers of 10	Divide whole numbers by powers of 10, by both considering place value change and using strategies for mental division, including real-world problems.
5	5.NBT.B.5 5.NBT.B.6	Multi-Digit Division	Apply the standard algorithm and place value strategies for dividing multi-digit whole numbers, including real-world problems.
5	5.NBT.B.5 5.NBT.B.6	Multi-Digit Arithmetic: Comparing the Four Operations	Solve one-step real-world problems using any of the four operations and whole numbers.
5	5.OA.A.1 5.OA.A.2	Interpreting and Simplifying Multistep Expressions	Evaluate expressions with and without grouping symbols using multiple operations; solve real-world problems involving multistep operations; identify expressions involving multiple operations that model problems.

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5	5.NBT.B.6 5.OA.A.1	Using a Calculator Appropriately and Strategically	Assess the reasonableness of calculator output using mental computation, estimation strategies, and rounding; use order of operations in the calculator entries of multistep problems; use a calculator to solve real-world problems.
5	5.G.A.1 5.G.A.2	Introduction to Graphing Points and Scatterplots	Identify the positive integer coordinates of a point graphed in the coordinate plane; graph points with positive integer coordinates; represent discrete paired data on a scatterplot.
5	5.OA.B.3	Introduction to Related Numerical Patterns	Generate two numerical patterns using two given rules; identify apparent relationships between corresponding terms in two related numerical patterns; form ordered pairs consisting of corresponding terms from two patterns, and graph the ordered pairs on a coordinate plane.
5	5.NF.A.1 5.NF.A.2	Using Equivalent Fractions to Add and Subtract Fractions	Add and subtract two fractions with different denominators, including real-world problems; use visual representations to add and subtract fractions with denominators that are different but compatible, including real-world problems.
5	5.NF.B.5 5.NF.B.6	Multiplying a Fraction by a Fraction	Multiply fractions and mixed numbers; solve a variety of problems involving a fractional part of a fraction.
5	5.NF.B.5	Multiplication and Scaling	Compare the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
5	5.NBT.A.1 5.NBT.A.3.A	Place Value and Decimals	Convert decimals to thousandths in expanded, standard, or word form; model decimals to hundredths; state the meaning of a given digit to thousandths.
5	5.NBT.A.3.A 5.NBT.A.4	Decimals on the Number Line and Rounding Decimals	Plot and name decimals on the number line; round decimals using a number line and place value strategies.
5	5.NBT.A.3.A 5.NBT.A.3.B	Comparing Decimals	Compare decimals using various place value strategies and real-world measurements.
5	5.NBT.B.7	Adding Decimals	Add decimals using a variety of strategies, including counting up and the standard algorithm; use decimals to find real-world sums involving money.

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5	5.NBT.B.7	Subtracting Decimals	Subtract by place value using a variety of strategies including counting up and the standard algorithm; solve real-world problems involving subtraction of decimals.
5	5.NBT.B.7	Multiplying and Dividing Decimals by a Power of 10	Multiply and divide decimals by powers of 10, including real-world problems.
5	5.NBT.B.7	Multiplying a Whole Number by a Decimal Less than 1	Multiply whole numbers by decimals less than one, including real-world problems; use rounding to estimate a product before computing as a means of developing a sense of the size of the product, including real-world problems.
5	5.NBT.B.7	Multiplying Decimals	Multiply decimals to the hundredths place, including real-world problems; use rounding to estimate a product before computing as a means of developing a sense of the size of the product, including the position of the decimal point in the product, including real-world problems.
5	5.NF.A.3	Equivalent Fractions and Decimals	Find the fraction form of a decimal, including common repeating decimals; interpret a/b as the quotient of a and b in order to find a decimal equivalent for a/b by dividing.
5	5.NBT.B.7 5.NF.A.2	Ordering, Adding, and Subtracting Fractions and Decimals	Order a list of fractions and decimals using strategies including a number line, common denominators, rounding, and benchmarks; use rounding, benchmarks, and common denominators to compare decimals to fractions and to estimate a sum or difference before or after computing.
5	5.NBT.B.7	Word Problems: Multiplying by a Fraction and a Decimal	Solve real-world problems involving multiplication of fractions and decimals.
6	6.RP.A.1	Describing Part-to-Part Relationships	Use models to represent relationships between quantities; describe ratio relationships between two quantities using informal language.
6	6.RP.A.1	Using Ratio Notation	Use the notation of ratio language to describe relationships between two quantities.
6	6.RP.A.3.A	Equivalent Ratios	Find missing values in a table using ratio reasoning; analyze patterns in a table of equivalent ratios.
6	6.RP.A.2 6.RP.A.3.A 6.RP.A.3.B	Understanding Unit Rates	Find unit rates.

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6	6.RP.A.1 6.RP.A.3.A	Comparing Ratios	Compare ratios in mathematical contexts, including using visual models.
6	6.RP.A.3.A	Ratios in Real-World Situations	Compare ratios in real-world contexts.
6	6.RP.A.3.A 6.RP.A.3.D	Measurements in the Customary System	Convert units of measurement (capacity, length, time, weight) in the customary system, including real-world problems.
6	6.RP.A.3.D	Measurements in the Metric System	Convert metric units of measurement, including solving real-world problems.
6	6.RP.A.3.D	Converting Measurements between Systems	Convert measurement units between the customary and metric systems.
6	6.RP.A.2 6.RP.A.3.B	Understanding Speed	Convert measures of speed within a system; find speed given distance and time.
6	6.RP.A.2 6.RP.A.3.B	Unit Pricing	Find unit prices, and use them to solve unit rate problems.
6	6.NS.A.1	Dividing a Fraction by a Whole Number	Divide a fraction by a whole number equal to the fraction's numerator in real-world situations.
6	6.NS.A.1	Using Visual Models in Fraction Division	Use models to divide a whole number by a fraction.
6	6.NS.A.1	Dividing a Fraction by a Fraction	Use models to divide a fraction by a fraction.
6	6.NS.A.1	Finding a Rule for Dividing Fractions	Use the standard algorithm to divide fractions
6	6.NS.A.1	Fraction Division in the Real World	Write and solve real-world problems using fraction division.
6	6.NS.A.1	Fraction Multiplication and Division	Solve real-world problems using fraction multiplication and fraction division.

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6	6.NS.B.3	Adding and Subtracting Decimals	Add and subtract decimals.
6	6.NS.B.4	Prime Numbers and Prime Factorization	Identify a number as prime or composite; represent a number as the product of its prime factors, using exponents to show repeated factors.
6	6.NS.B.4	Factors and Multiples	Determine the greatest common factor and the least common multiple of two numbers, including real-world problems.
6	6.NS.B.4	The Distributive Property	Use the Distributive Property to generate equivalent expressions.
6	6.NS.B.2 6.NS.B.3	Using a Rule to Find Decimal Products	Multiply decimals, and use a rule to place the decimal point in a product; use estimation to determine reasonableness.
6	6.NS.B.2	Dividing Whole Numbers	Divide whole numbers with and without remainders, writing remainders as terminating or repeating decimals; includes real-world problems.
6	6.NS.B.2 6.NS.B.3	Dividing Decimals	Divide whole numbers by decimals, and divide decimals by decimals; use estimation to determine reasonableness.
6	6.RP.A.3.C	Understanding Percent	Solve problems involving percents of 100; use models to illustrate the meaning of percents; convert fractions to percents by finding an equivalent fraction over 100.
6	6.RP.A.3.C	Fraction-Decimal-Percent Equivalents	Find equivalent forms of fractions, decimals, and percents without models.
6	6.RP.A.3.C	Finding Friendly Percentages	Find 10%, 25%, or 50% of a number by dividing by 10, 4, or 2, including real-world problems; find percentages by adding familiar parts, including real-world problems.
6	6.RP.A.3.C	Using Multiplication to Find Percents	Find a percent of a number using multiplication.
6	6.RP.A.3.C	Using Equivalent Ratios to Find Percents	Represent percent problems using equivalent ratios; find the part of a whole that is not a multiple of 100, given a percent.
6	6.NS.C.5	Negative Numbers in Real-World Contexts	Use positive and negative numbers to represent quantities in real-world contexts, and describe the meaning of zero in real-world contexts.

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6	6.NS.C.6.A	Integers on the Number Line	Identify integers, and graph them on number lines; find the opposite of an integer.
6	6.NS.C.6.C	Plotting Positive and Negative Fractions	Graph negative fractions on a number line; use a number line to compare and order positive and negative fractions.
6	6.NS.C.6.C 6.NS.C.7.A 6.NS.C.7.B	Comparing Rational Numbers	Graph rational numbers on a number line; compare rational numbers using symbols =, <, and >.
6	6.NS.C.6.C 6.NS.C.7.A 6.NS.C.7.B	Ordering Rational Numbers	Order rational numbers; write and interpret statements of comparison for rational numbers in real-world contexts.
6	6.NS.C.7.C 6.NS.C.7.D	Absolute Value	Define absolute value, and find the absolute value of an integer.
6	6.NS.C.6.C	The Coordinate Plane	Identify the parts of the coordinate plane; graph and name points in Quadrant I.
6	6.NS.C.6.B 6.NS.C.6.C	Plotting Points in the Four Quadrants	Graph and name points in all four quadrants; identify the quadrant a point lies in.
6	6.NS.C.9	Distance between Two Points	Find the distance between any two points and between two points in the same quadrant that have the same x- or y-coordinate.
6	6.G.A.3	Polygons in the Coordinate Plane	Identify polygons in the coordinate plane given coordinates of the vertices; find lengths of sides for polygons drawn in the coordinate plane.
6	6.RP.A.3.A	Plotting Equivalent Ratios	Plot tables of equivalent ratios on the coordinate plane, and identify patterns of the plots.
6	6.RP.A.3.A	Analyzing Equivalent Ratios in the Coordinate Plane	Analyze the graph of equivalent ratios plotted on the coordinate plane; use the language of ratios to explain the graph of equivalent ratios in real-world contexts.
6	6.EE.A.1	Numerical Expressions with Exponents	Write numerical expressions without exponents and with whole number exponents; evaluate numerical expressions without exponents and with exponents.

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6	6.EE.A.2.B 6.EE.B.6	Expressions with Unknowns	Represent addition or subtraction algebraic expressions using algebra tiles; use algebraic expressions to model real-world and mathematical situations involving addition and subtraction.
6	6.EE.A.2.A 6.EE.A.2.C 6.EE.B.6	Writing and Evaluating Expressions	Use algebraic expressions to model real-world and mathematical situations involving multiplication and division; evaluate algebraic expressions containing one operation.
6	6.EE.A.2.A 6.EE.A.2.B 6.EE.A.2.C 6.EE.B.6	Expressions with More Than One Operation	Write algebraic expressions containing more than one operation, and use the Order of Operations to evaluate the same.
6	6.EE.A.2.B 6.EE.A.2.C	Expressions with and without Parentheses	Write algebraic expressions containing more than one operation, with parentheses, and use the Order of Operations to evaluate the same.
6	6.EE.A.2.A 6.EE.A.2.C 6.EE.B.6	Working with Formulas	Evaluate scientific and mathematical formulas for given values.
6	6.EE.A.3 6.EE.A.4	Equivalent Expressions	Generate equivalent expressions using the commutative and associative properties; use substitution to determine if two expressions without parentheses are equivalent.
6	6.EE.A.2.B 6.EE.A.3 6.EE.A.4	Equivalent Expressions and the Distributive Property	Generate equivalent expressions using the distributive property; use substitution to determine if two expressions are equivalent expressions; may include parentheses.
6	6.EE.A.2.B 6.EE.A.3 6.EE.A.4	Determining Equivalent Expressions	Determine whether two expressions are equivalent, and explain why they are or are not equivalent.
6	6.EE.B.5 6.EE.B.7	Finding Unknown Numbers	Use bar models and informal reasoning to solve for unknown quantities in simple one-step equations.
6	6.EE.B.5 6.EE.B.7	Writing Equations to Find Unknowns	Write equations to represent statements; determine if a number makes an equation true using substitution; explain the differences between equations and expressions.

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6	6.EE.B.5 6.EE.B.7	Solving One-Step Equations: Addition and Subtraction	Solve one-step addition and subtraction equations.
6	6.EE.B.7	Solving One-Step Equations: Multiplication and Division	Solve one-step multiplication and division equations.
6	6.EE.B.7	Modeling Real-World Problems with One-Step Equations	Model, write, and solve real-world problems using one-step variable equations involving addition, subtraction, multiplication, and division of nonnegative rational numbers.
6	6.EE.B.8	Writing Inequalities	Write an inequality to represent a constraint or condition in a real-world or mathematical problem; describe the set of numbers that make the inequality true; write real-world scenarios given one-step inequalities.
6	6.EE.B.8	Graphing Inequalities on a Number Line	Represent solutions of inequalities on number line diagrams.
6	6.G.A.3	Finding Area on a Coordinate Plane	Find lengths of sides for rectangles drawn in the coordinate plane; calculate the area of a rectangle drawn in the plane.
6	6.G.A.1	Area of Parallelograms	Use a formula with = to find the area of a parallelogram, including real-world problems.
6	6.G.A.1	Area of Triangles	Calculate the area of triangles using a formula with =, including real-world problems.
6	6.G.A.1	Area of Special Quadrilaterals	Find the area of special quadrilaterals, including real-world problems.
6	6.G.A.1	Area of Irregular Figures	Calculate the area of irregular figures, including real-world problems.
6	6.G.A.1	Shapes with Fractional Side Lengths	Find the area of triangles and rectangles that have fractional or decimal side lengths, including real-world problems and problems with both decimals and fractions; find the area of irregular figures that have decimal side lengths, including the same types of problems.

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7	7.RP.A.1 7.RP.A.2.A	Unit Rates	Use a given unit rate and proportional reasoning to complete a table and solve problems.
7	7.RP.A.1 7.RP.A.2.A 7.RP.A.2.B	Finding a Constant of Proportionality	Find the constant of proportionality from verbal descriptions, tables, graphs, and diagrams.
7	7.RP.A.1	Applications of Unit Rates	Determine a unit rate from a real world context; apply unit rates to solve for an unknown in real world problems; use unit rates to make comparisons.
7	7.RP.A.2.A 7.RP.A.2.B 7.RP.A.2.D	Graphing Proportional Relationships	Graph a proportional relationship from tables and from verbal descriptions; identify the meanings of points on the graph of a proportional relationship; determine the characteristics of such a graph.
7	7.RP.A.2.A	Identifying Proportional Relationships	Analyze data in tables and graphs to determine if the given relationships are proportional.
7	7.RP.A.2.A 7.RP.A.2.B 7.RP.A.2.C	Equations of Proportional Relationships	Identify the constant of proportionality from an equation; translate between tables, graphs, and equations, and write an equation to represent a proportional relationship.
7	7.RP.A.2.A 7.RP.A.3	Proportions	Write a proportion to represent a given relationship; solve proportion problems by using equivalent fractions, and solve those involving complex fractions.
7	7.RP.A.3	Introduction to Percents	Identify an equivalent percent, fraction, or decimal represented in multiple forms; create diagrams to solve for a percent in real world problems; find the percent of a number using the fractional or decimal equivalent form of a percent to write an expression from a diagram.
7	7.RP.A.3	Finding a Percent of a Number	Solve problems by finding the percent of a number, including amounts of gratuity and tax, by using diagrams and expressions; find the percent of a number when the percent is more than 100.
7	7.RP.A.3	Finding a Total Amount	Solve for the total amount in gratuity, tax, or commission problems by using diagrams and expressions, understanding that it is a process of adding to the original amount; find the total, including discounts, understanding that it is a process of subtracting from the original amount.

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7	7.RP.A.3	Finding an Original Amount	Find the original amount in real world percent problems involving gratuity, tax, commission, markup, discount, or markdown.
7	7.RP.A.3	Percent Increase and Decrease	Find the percent change by using the ratio of change in quantity to original amount; use percent increase and decrease to solve real world problems.
7	7.RP.A.3	Applications of Percent	Solve multi-step percent problems involving tax, gratuity, commission, markup, discount, and markdown.
7	7.NS.A.1.A 7.NS.A.1.D	Using Properties of Operations	Apply associative and commutative properties of operations to simplify expressions; apply the distributive property to rewrite and evaluate expressions.
7	7.NS.A.2.C	Adding Integers	Use visual representations and apply properties of operations to add integers, including real-world problems.
7	7.NS.A.1.B	Subtracting Integers	Use visual representations, additive inverse, and properties of operations to subtract integers, including real-world problems.
7	7.NS.A.1.C	Multiplying Integers	Use visual representations, properties of operations, and rules of signed numbers to multiply integers, including real-world problems.
7	7.NS.A.2.A	Dividing Integers	Use visual representations, properties of operations, and rules of signed numbers to divide integers, including real-world problems.
7	7.NS.A.1.A 7.NS.A.2.B	Operations with Integers	Solve integer problems involving a variety of operations while applying the properties of operations.
7	7.NS.A.2.A	Solving Problems Involving Integers	Apply properties of operations to solve real-world and mathematical problems involving more than one operation with integers.
7	7.NS.A.3	Rational Numbers	Represent positive and negative rational numbers on vertical number lines and horizontal number lines; write a rational number as a decimal that eventually terminates or repeats; describe real-world situations that can be represented by rational numbers, including where opposite quantities combine to make 0.
7	7.NS.A.1.A 7.NS.A.1.B 7.NS.A.1.D	Adding and Subtracting Fractions	Add and subtract rational numbers in fraction form, including with the use of visual representations.
7	7.NS.A.2.A 7.NS.A.2.C	Multiplying Fractions	Multiply rational numbers in fraction form; use the rules of signed numbers and properties of operations to multiply fractions; estimate products of fractions.

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Placement Grade	CCSS	Lesson Title	Lesson Description
7	7.NS.A.2.A 7.NS.A.2.C	Dividing Fractions	Divide rational numbers in fraction form; use the rules of signed numbers and properties of operations to divide fractions; estimate quotients of fractions.
7	7.NS.A.2.C 7.NS.A.3	Solving Problems Involving Rational Numbers	Solve real-world and mathematical problems involving addition, subtraction, multiplication, and division with rational numbers.
7	7.EE.B.3 7.EE.B.4.A	Understanding Expressions	Identify the parts of an algebraic expression, and evaluate expressions.
7	7.EE.3 7.EE.B.4.A	Writing and Evaluating Expressions	Write and evaluate expressions to represent real-world situations.
7	7.EE.A.1	Using Properties to Simplify Expressions	Simplify expressions using properties of operations and combining like terms.
7	7.EE.A.1 7.EE.A.2 7.EE.B.3	Adding and Subtracting Expressions	Add and subtract algebraic expressions.
7	7.EE.A.1 7.EE.A.2	Expanding Expressions	Use the distributive property to expand algebraic expressions; identify equivalent expressions.
7	7.EE.A.1	Factoring Expressions	Rewrite algebraic expressions by factoring.
7	7.EE.B.4.A	Writing Equations	Write equations from words, including those that represent real-world situations.
7	7.EE.B.3 7.EE.B.4.A	Solving Two-Step Equations	Solve two-step equations in the real world, and interpret the result.
7	7.EE.B.4.A	Solving Multi-Step Equations	Solve multi-step equations in the real world, and interpret the result.
7	7.EE.B.4.A	Writing Inequalities	Write inequalities from words, and vice-versa, to represent real-world situations.
7	7.EE.B.4.B	Addition and Subtraction Inequalities	Solve one-step addition and subtraction inequalities, including interpreting the result of solving real-world inequalities.
7	7.EE.B.4.B	Multiplication and Division Inequalities	Solve one-step multiplication and division inequalities, including interpreting the result of solving real-world inequalities.

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Placement Grade	CCSS	Lesson Title	Lesson Description
7	7.EE.B.4.B	Solving Two-Step Inequalities	Solve two-step inequalities, including interpreting the result of solving real-world inequalities.
7	7.RP.A.2.A	Scale Drawings and Area	Compute areas of figures from scale drawings.
7	7.G.B.5	Angle Relationships	Identify supplementary, complementary, vertical, and adjacent angles; use special relationships between supplementary or complementary angle pairs to find an unknown angle measure.
7	7.G.B.5	Finding Unknown Angle Measures	Use angle relationships to find unknown measures in a triangle and a figure; use a combination of angle relationships to find unknown measures in a figure.
7	7.G.A.2	Constructing Triangles	Construct triangles from given parameters; identify whether given parameters create a unique triangle, more than one triangle, or no triangle.
7	7.G.A.2	Constructing Geometric Figures	Construct geometric figures from given parameters.
8	8.F.B.5	Interpreting Graphs	Analyze qualitative graphs; interpret information given in a graph; create or describe a graph to model a situation.
8	8.F.A.1	Introduction to Functions	Identify functions from tables, graphs, and equations; determine if a real-world situation describes a functional relationship.
8	8.F.A.1	Using Function Notation	Identify the domain and range of a function given as a table, a graph, and a set of ordered pairs; use function notation to describe and evaluate a function.
8	8.F.A.1 8.F.A.3	Linear vs. Nonlinear Functions	Interpret rate of change from a graph and a table; differentiate functions as either linear or non-linear.
8	8.F.A.2 8.F.A.4	Constructing Linear Functions	Analyze linear functions to find the rate of change and initial value; interpret the rate of change and initial value of a linear function in terms of the situation it models.
8	8.EE.B.5	Rate of Change and Introduction to Slope	Determine the positive slope of a line from a table and a graph; compare positive slopes in a real-world situation.
8	8.F.B.4	Exploring Slope	Recognize the difference between positive slope, negative slope, no slope, and zero slope; determine the value of the slope of a line from a table and a graph.
8	8.EE.B.6	Slope-Intercept Form	Analyze a graph to determine slope and y-intercept; graph a linear function using the slope and y-intercept; write a linear equation in slope-intercept form given the slope and y-intercept.

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Placement Grade	CCSS	Lesson Title	Lesson Description
8	8.F.B.4	Standard Form	Analyze a linear graph to determine the intercepts; write linear equations in standard form to model real-world scenarios; determine and interpret the intercepts of a linear function from an equation in standard form.
8	8.F.B.4	Writing Linear Equations Given Two Points	Write a linear equation in slope-intercept form given two points.
8	8.F.B.4	Applying Linear Functions	Determine what the slope and y-intercept are and what they represent in real-world functional relationships; use real-world scenarios of linear functions to write an equation in slope-intercept form; evaluate inputs and outputs for linear equations in slope-intercept form.
8	8.F.B.4	Comparing Functions in the Real World	Analyze real-world linear relationships in order to make comparisons.
8	8.EE.C.7.A 8.EE.C.7.B	Solving with the Distributive Property	Solve one-variable linear equations using the distributive property.
8	8.EE.C.7.A 8.EE.C.7.B	Solving Equations with Rational Numbers	Solve one-variable linear equations with rational numbers using properties of equality.
8	8.EE.C.7.A	Modeling with Variables on Both Sides	Use algebra tiles to model and solve one-variable equations with variables on both sides with and without using zero pairs.
8	8.EE.C.7.A 8.EE.C.7.B	Solving with Variables on Both Sides	Solve equations with variables on both sides.
8	8.EE.C.7.A	Analyzing Solutions	Identify and solve equations that have one solution, infinitely many solutions, and no solution; write equations that have infinitely many solutions and no solution.
8	8.EE.C.8.A	Exploring Systems of Linear Equations	Determine if a given coordinate point is a solution to a system of linear equations; identify the unique solution of a system of two linear equations from a graph.
8	8.EE.C.8.A 8.EE.C.8.B	Using Graphs to Solve Systems	Rewrite linear equations to slope-intercept form; graph linear systems on the coordinate plane, and determine the solution of a linear system from the graph.

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Placement Grade	CCSS	Lesson Title	Lesson Description
8	8.EE.C.8.A 8.EE.C.8.C	Writing and Solving Systems	Create systems of equations from mathematical problems; solve systems of two linear equations given at least one graph or table.
8	8.EE.C.8.A 8.EE.C.8.B	Using Substitution to Solve Systems	Use substitution to solve a linear system.
8	8.EE.C.8.A 8.EE.C.8.B	Using Addition to Solve Systems	Use the linear combination method to solve linear systems.
8	8.EE.C.8.A 8.EE.C.8.B	Multiplying Two Equations to Solve Systems	Multiply two equations to solve systems; use the linear combination method to solve systems of linear equations after multiplying both equations.
8	8.EE.C.8.A 8.EE.C.8.B	Problem Solving with Systems	Write a system of linear equations to represent a real-world scenario; solve a real-world problem that can be modeled by such a system.
8	8.G.A.1.A 8.G.A.1.B	Congruence	Determine congruence of figures by measuring corresponding sides and angles; identify and write corresponding parts of congruent figures.
8	8.G.A.1.A 8.G.A.1.B 8.G.A.1.C 8.G.A.2 8.G.A.3	Overview of Transformations	Identify transformation and the types of transformation; recognize pre-image and post-image of transformations, and label and name the post-image.
8	8.G.A.3	Translations	Identify and describe a translation on the coordinate plane; translate figures on the coordinate plane given as an ordered pair and verbal expression; describe a translation using coordinates.
8	8.G.A.3	Reflections	Identify and describe a reflection on the coordinate plane; reflect figures on the coordinate plane given the line of reflection; describe a reflected figure using the line of reflection and coordinates.
8	8.G.A.3	Rotations in the Coordinate Plane	Rotate figures on the coordinate plane given the degree and direction; describe a rotation of a figure using coordinates.
8	8.G.A.3	Dilations	Identify and describe a dilation on a coordinate plane; identify the scale factor, given the pre-image and the dilated-image; describe a dilation by its coordinates using the scale factor.

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Placement Grade	CCSS	Lesson Title	Lesson Description
8	8.G.A.4	Similarity and Transformations	Recognize and determine similarity of figures by measuring corresponding side lengths and angle measure; identify the transformation in which the post-image is similar to the pre-image; describe a sequence of transformations that results in a similar figure.
8	8.G.A.5	Angle Relationships	Identify vertical, adjacent, complementary, and supplementary angles; find missing angle measures using angle relationships both with and without algebraic expressions.
8	8.G.A.5	Transversals	Determine angle relationships created by a transversal line crossing two non-parallel lines; find angle measures, and recognize congruent angles.
8	8.G.A.5	Parallel Lines Cut by a Transversal	Identify interior angles, exterior angles, alternate interior angles, and alternate exterior angles when a transversal crosses parallel lines; find missing measurements using angle relationships in a diagram of a transversal crossing parallel lines.
8	8.G.A.5	Sum of Interior Angles of a Triangle	Investigate and confirm that the sum of interior angles of a triangle is 180 degrees by rearranging the angles to create a straight line; informally prove that this sum is 180 degrees using alternate interior angles; informally prove that this sum is 180 degrees when a triangle is created by transversals crossing parallel lines using angle relationships, corresponding angles, and congruence.
8	8.G.A.5	Exterior Angles of a Triangle	Use angle relationships to establish facts about exterior angles of a triangle; determine angle measures of exterior angles of a triangle, and determine their sum.
8	8.G.A.5 8.EE.C.7.A 8.EE.C.7.B	Solving for Unknown Angles in Triangles	Use algebra to find a missing angle measure of an interior angle of a triangle; find missing angle measures of interior and exterior angles of triangles when involving transversals and parallel lines.
8	8.EE.A.1	Powers and Exponents	Evaluate powers using fractional and negative bases.
8	8.EE.A.1	Zero and Negative Exponents	Evaluate powers of zero and negative exponents; simplify expressions of exponents of these types.
8	8.EE.A.1	Raising a Power to a Power	Simplify and evaluate expressions of raising a power to a power of integer exponents.

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Placement Grade	CCSS	Lesson Title	Lesson Description
8	8.EE.A.1	Evaluating Expressions with Exponents	Simplify expressions using the rules of exponents; evaluate expressions using substitution of the variables.
8	8.EE.A.3	Introduction to Scientific Notation	Convert very small and very large numbers between scientific notation and standard notation.
8	8.EE.A.4	Operations with Scientific Notation	Evaluate products and quotients of scientific notation values; recognize scientific notation answers generated by technology, and identify the symbols associated with the value; identify proper units of measurement for quantities written in scientific notation.
8	8.EE.A.2	Solving Square Root Equations	Simplify square roots of perfect and non-perfect squares; solve equations of the for x squared equals p, where p is a whole number.
8	8.EE.A.2	Solving Cube Root Equations	Simplify cube roots of perfect and non-perfect cubes; solve equations of the form x cubed equals p, where p is an integer.
8	8.G.B.6	Exploring the Pythagorean Theorem	Identify the hypotenuse in right triangles presented with different orientations.
8	8.G.B.7	Finding the Hypotenuse in Right Triangles	Given lengths of any two legs of a right triangle, find the length of the hypotenuse, including real-world problems.
8	8.G.B.7	Unknown Leg Lengths in Right Triangles	Given the length of one leg and the hypotenuse of a right triangle, find the length of the other leg, including real-world problems; given the length of the hypotenuse of an isosceles right triangle, find the length of the legs, including real-world problems.
8	8.G.B.8	Finding Distance in the Coordinate Plane	Plot vertices of a triangle on a coordinate plane; given a coordinate pair, construct a right triangle on a coordinate grid with the right angle at the origin; calculate the distance from any given coordinate pair and the origin.
9	N.Q.A.1 N.Q.A.2	Quantitative Reasoning	Describe a quantitative relationship shown in a table and a graph, including graphs without scales; interpret a graph given with or without a scale to determine the quantitative relationship it describes.

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Placement Grade	CCSS	Lesson Title	Lesson Description
9	N.Q.A.1 N.Q.A.2 N.Q.A.3	Dimensional Analysis	Use dimensional analysis to convert units and compare quantities.
9	N.Q.A.1 A.CED.A.2 A.REI.D.10	Writing and Graphing Equations in Two Variables	Construct a table of values and/or a graph for a two-variable linear equation that models a situation; identify solutions that are or are not viable based on a given context; interpret graphs and rates by examining the quantities represented by each axis; write a two-variable linear equation to model a quantitative relationship, describing the constraints of the model based on the context.
9	F.IF.A.2	Evaluating Functions	Analyze a function represented by an equation, a table, and a graph to determine the output when given the input, and vice versa; write the inverse of a given linear function.
9	F.IF.A.1 F.IF.B.4 F.IF.B.5	Analyzing Graphs	Use the graph of a function to determine x- or y-intercepts, where the function is positive or negative, any local maximum or minimum in a given interval, and end behavior.
9	F.IF.A.1 F.IF.B.4	Analyzing Tables	Given a table of values for a continuous function, make predictions about the intercepts of the graph of the function, the end behavior of the graph of the function, where the function is positive or negative, where the function is increasing or decreasing, and local maximum or minimum in a given interval of the function.
9	F.IF.A.2 F.IF.A.3	Recognizing Patterns	Classify a sequence as arithmetic or geometric; use a recursive rule to calculate a term of a sequence; write a recursive rule for a sequence.
9	F.IF.A.1 F.IF.B.5 F.IF.B.6 F.IF.C.9	Introduction to Linear Functions	Calculate the rate of change of a function; determine the initial value of a function; determine if a relationship is linear by analyzing the rate of change.
9	F.IF.B.6	Slope of a Line	Determine the slope of a line from a graph, a table of values, and ordered pairs; identify if the slope of a linear relationship is zero, positive, negative, or undefined; interpret slope in the context of real-world scenarios.

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Placement Grade	CCSS	Lesson Title	Lesson Description
9	F.IF.A.1 F.IF.B.5 F.IF.B.6 F.IF.C.7.A	Slope-Intercept Form of a Line	Identify the slope and/or y-intercept of a linear function given in slope-intercept form; graph a linear function given in slope-intercept form; write a linear function, in slope-intercept form, from a graph and from a verbal description or scenario.
9	F.IF.A.1 F.IF.B.5 F.IF.B.6 F.IF.C.7.A	Point-Slope Form of a Line	Identify the slope and/or y-intercept of a linear function given in point-slope form, and graph the linear function; write the equation of a line given its slope and a point on the line in point-slope form, and express the relationship as a function.
9	F.IF.A.1 F.IF.B.5 F.IF.B.6	Writing Linear Equations	Use linear models to solve problems; write two-variable linear equations in different forms using varying pieces of information about the relationships.
9	A.CED.A.1 A.CED.A.2 A.CED.A.3 A.REI.B.3	Solving Mixture Problems	Use a table to organize information given in mixture problems; write and solve one-variable linear equations to model and solve mixture problems.
9	A.CED.A.1 A.CED.A.2 A.CED.A.3 A.REI.B.3	Solving Rate Problems	Use a table to organize information given in time-distance-rate and work problems; write and solve one-variable linear equations to model and solve problems of these types.
9	A.CED.A.1 A.CED.A.2 A.CED.A.3 A.REI.B.3	Solving Absolute Value Equations	Create absolute value equations to model and solve problems; solve absolute value equations, pointing out solutions that are or are not viable in a modeling context.
9	A.CED.A.1 A.CED.A.3	Introduction to Compound Inequalities	Relate the solution set of a compound inequality to its graph; write compound inequalities to model problems.
9	A.CED.A.3	Modeling with Systems of Linear Equations	Create a system of linear equations to model a problem; interpret the solution of a system of linear equations in a modeling context.

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Placement Grade	CCSS	Lesson Title	Lesson Description
9	A.REI.D.12	Graphing Two-Variable Linear Inequalities	Relate the graph of a two-variable linear inequality to its algebraic representation.
9	A.CED.A.3 A.REI.D.12	Modeling with Two-Variable Linear Inequalities	Create a two-variable linear inequality to model a problem; interpret the solutions of a two-variable linear inequality in a modeling context.
9	A.REI.D.12	Solving Systems of Linear Inequalities	Determine a system of two-variable linear inequalities given a solution set; graph a system of two-variable linear inequalities, and identify solutions of such a system.
9	F.IF.A.2 F.IF.B.5 F.IF.C.7.B	Absolute Value Functions and Translations	Analyze key features of the absolute value function and its translations; graph translations of the absolute value function.
9	F.IF.A.2 F.IF.B.5 F.IF.C.7.B	Reflections and Dilations of Absolute Value Functions	Graph translations, reflections, and/or dilations of the absolute value function; state the domain and range of reflections and dilations of the absolute value function.
9	F.IF.C.7.E	Exponential Growth Functions	Graph an exponential growth function, and state its domain and range; identify an exponential growth function given tables, graphs, and function rules, determining the rate of change; write an exponential growth function to model a real-world problem, pointing out constraints in the modeling context.
9	F.IF.C.7.E	Exponential Decay Functions	Graph an exponential decay function, and state its domain and range; identify an exponential decay function given tables, graphs, and function rules, determining the rate of change; write an exponential decay function to model a real-world problem, pointing out constraints in the modeling context.
9	F.IF.C.7.E	Vertical Stretches and Shrinks of Exponential Functions	Determine the parameters and/or create an equation for a vertically dilated exponential growth or decay function given a table, equation, or scenario; match a graph, table, or scenario to an equation of a function of either type or vice versa.
9	F.IF.C.7.E F.IF.C.8.B	Reflections of Exponential Functions	Graph reflections of exponential functions, and determine the domain and/or range of exponential functions reflected across an axis.

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Placement Grade	CCSS	Lesson Title	Lesson Description
9	F.IF.C.7.E	Translations of Exponential Functions	Graph and describe translations of exponential functions; analyze their key aspects.
9	N.RN.A.1 N.RN.A.2 A.SSE.B.3.C	Exponential Functions with Radical Bases	Simplify and evaluate exponential expressions having whole number bases and fractional exponents; determine key aspects of an exponential function having a radical base by rewriting it using exponent properties; transform expressions in radical form to exponential form and vice versa.
9	F.IF.A.3	Geometric Sequences	Write recursive and explicit rules for geometric sequences using function notation; graph and analyze geometric sequences as a special case of exponential functions with the domain restricted to natural numbers.
9	A.SSE.A.1.A A.SSE.A.2	Introduction to Polynomials	Identify a polynomial and its equivalent forms; classify a polynomial by degree and/or number of terms.
9	A.APR.A.1	Adding and Subtracting Polynomials	Add and subtract polynomials; find and evaluate polynomial sums or differences that model real-world situations; determine the degree or number of terms in a polynomial sum or difference.
9	A.APR.A.1	Multiplying Monomials and Binomials	Multiply a binomial by a monomial and by a binomial using geometric models and algebraically; identify a product that results in the difference of squares or a perfect square trinomial.
9	A.SSE.A.1.A A.APR.A.1	Multiplying Polynomials and Simplifying Expressions	Simplify polynomial expressions involving multiple operations; multiply a binomial by a trinomial algebraically and by using geometric models.
9	A.SSE.A.1.B A.SSE.A.2	Factoring Polynomials: GCF	Write a polynomial as the product of a monomial and polynomial having the same number of terms; determine the greatest common monomial factor of two or more terms.
9	A.SSE.A.2	Factoring Polynomials: Double Grouping	Factor a polynomial by double grouping, or indicate that the polynomial is prime.

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Placement Grade	CCSS	Lesson Title	Lesson Description
9	A.SSE.A.2	Factoring Trinomials: a = 1	Determine if a trinomial with a leading coefficient of 1 and a positive constant is factorable, and, if so, write it in factored form; relate the factorization to a geometric model.
9	A.SSE.A.2	Factoring Trinomials: a = 1 (Continued)	Determine if a trinomial with a leading coefficient of 1 and a negative constant is factorable, and, if so, write it in factored form; relate the factorization to a geometric model.
9	A.SSE.A.2	Factoring Trinomials: a > 1	Determine if a trinomial with a leading coefficient greater than 1 is factorable, and, if so, write it in factored form; relate the factorization to a geometric model.
9	A.SSE.A.2	Factoring Polynomials: Difference of Squares	Determine if a polynomial is factorable by recognizing that it is a difference of two squares and, if so, applying the identity; identify a monomial that is a perfect square, and find the square root.
9	A.SSE.A.2	Factoring Polynomials: Sum and Difference of Cubes	Determine if a polynomial is factorable by recognizing that it is a sum or difference of two cubes and, if so, applying the identity; identify a monomial that is a perfect cube, and find the cube root.
9	A.SSE.A.2	Factoring Polynomials Completely	Analyze the structure of a polynomial to write it in completely factored form.
9	F.IF.B.4 F.IF.C.7.A	Introduction to Quadratic Functions	Identify a quadratic function and values of the coefficients and constant from the standard form; calculate the rate of change of a quadratic function over an interval of its domain, and compare it to linear and exponential functions; evaluate a quadratic function using tables, graphs, and equations.
9	A.SSE.B.3.A F.IF.C.7.A	Quadratic Functions: Standard Form	Graph a quadratic function given in standard form, and identify key features from the graph; identify key features from the equation of a quadratic function given in standard form.
9	F.IF.B.4 F.IF.C.7.A	Quadratic Functions: Vertex Form	Graph a quadratic function given in vertex form; identify key features from the graph of an equation of a quadratic function given in vertex form; identify key features from the equation of a quadratic function given in vertex form.

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Placement Grade	CCSS	Lesson Title	Lesson Description
9	A.SSE.B.3.B F.IF.B.4 F.IF.C.7.A F.IF.C.8.A	Completing the Square	Write quadratic functions given in standard form and with a = 1 into vertex form by completing the square; relate the geometric model of completing the square to the algebraic process.
9	A.SSE.B.3.B F.IF.B.4 F.IF.C.7.A F.IF.C.8.A	Completing the Square (Continued)	Write quadratic functions given in standard form into vertex form by completing the square; relate the parameters of a quadratic function in vertex form to transformations of the graph y = x squared.
9	A.REI.B.4.B A.REI.C.6	Solving Quadratic Equations: Zero Product Property	Solve problems by factoring quadratic equations given in standard form; write quadratic equations given rational solutions.
9	A.REI.B.4.B A.REI.C.6	Solving Quadratic Equations: Factoring	Solve problems by rewriting quadratic equations in standard form and factoring, pointing out the solutions that are viable or not viable in a modeling context; write a quadratic equation that models a scenario.
9	A.REI.B.4.B A.REI.C.6	Solving Quadratic Equations: Square Root Property	Use the square root property to solve quadratic equations.
9	A.REI.B.4.A A.REI.B.4.B	Solving Quadratic Equations: Completing the Square	Solve a quadratic equation whose leading coefficient is 1 by completing the square.
9	A.REI.B.4.A A.REI.B.4.B	Solving Quadratic Equations: Completing the Square (Continued)	Solve a quadratic equation whose leading coefficient is greater than 1 by completing the square.
9	A.REI.B.4.A A.REI.B.4.B	Introduction to the Quadratic Formula	Determine the values of a, b, and c from a given quadratic equation in standard form; recognize an expression that uses the quadratic formula to find the solutions of a quadratic equation; determine the value of the discriminant of a quadratic equation.

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Placement Grade	CCSS	Lesson Title	Lesson Description
9	A.REI.B.4.B A.REI.C.6	Solving Quadratic Equations: Quadratic Formula	Solve a quadratic equation using the quadratic formula; determine the number of real zeros of a quadratic function by finding the values of a, b, and c and then calculating the discriminant.
9	A.REI.B.4.B F.IF.B.4	Modeling with Quadratic Equations	Write and solve quadratic equations to model real-world scenarios, estimating where appropriate and identifying solutions that are not viable in terms of the context.
9	N.Q.A.1 F.IF.A.2	Line of Best Fit	Determine if a data set shows a correlation and, if so, the type of correlation; use technology to determine the line of best fit for a data set, and interpret the parameters of the model in context; use a line of best fit to make a prediction.
9	A.CED.A.3 F.IF.A.2	Regression Models	Determine an exponential, quadratic, or linear model for a given data set using technology; identify limitations of models in real-world contexts; interpret the graph of a regression model in the context of the problem; use a linear, quadratic, or exponential regression model to make a prediction.
10	G.CO.A.1	Euclidean Geometry	Identify and name undefined terms of point, line, plane, and distance along a line; analyze descriptions and diagrams that illustrate basic postulates about points, lines, and planes.
10	G.CO.A.1	Defining Terms	Identify and name a ray and/or a line segment; identify and name an angle, an arc, and/or a circle; identify and name a pair of parallel lines and/or a pair of perpendicular lines.
10	G.CO.A.1	Measuring Length and Angles	Apply the protractor postulate and angle addition postulate to calculate angle measures; apply the ruler postulate and segment addition postulate to calculate the lengths of line segments; identify a midpoint of a line segment and a bisector of an angle.
10	G.CO.C.9	Introduction to Proof	Identify proof formats, essential parts of a proof, and assumptions that can be made from a given drawing.
10	G.CO.C.9	Linear Pairs and Vertical Angles	Calculate angle measures by using definitions and theorems about linear pairs and vertical angles; complete the steps to prove statements using linear pairs and vertical angles; identify linear pairs and vertical angles from given diagrams.
10	G.CO.C.9	Complementary and Supplementary Angles	Complete the steps to prove statements using complementary angles and supplementary angles; identify these angles from given diagrams, and solve problems involving their measures.

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Placement Grade	CCSS	Lesson Title	Lesson Description
10	G.CO.A.2 G.CO.A.5	Compositions	Determine the image of a figure after a given composition of transformations; determine the rule that describes a given composition of transformations.
10	G.CO.A.3	Symmetry	Identify rotational symmetry and its order in geometric figures; identify reflectional symmetry in geometric figures and the number of lines of symmetry.
10	G.CO.C.9	Parallel and Perpendicular Lines	Solve problems involving the distance from a point on the perpendicular bisector to both endpoints of the line segment; identify parallel, perpendicular, and skew lines from three-dimensional figures.
10	G.CO.C.9	Lines Cut by a Transversal	Solve for angle measures when parallel lines are cut by a transversal, and complete the steps to prove angle relationships.
10	G.CO.C.9	Proving Lines Parallel	Apply theorems to determine if lines are parallel; prove lines are parallel given angle relationships.
10	G.GPE.B.5	Slopes of Parallel and Perpendicular Lines	Complete the steps to prove the slope criteria for parallel and perpendicular lines using coordinate geometry; determine if two lines are parallel or perpendicular; use slope criteria to find additional points on a parallel or perpendicular line.
10	G.GPE.B.5	Writing Linear Equations	Write the equation of a line perpendicular to a given line or segment that goes through a particular point; write the equation of a line parallel to a given line that goes through a particular point.
10	G.CO.C.10	Triangle Angle Theorems	Calculate the measures of interior and exterior angles of a triangle, and complete the steps to prove that the sum of the measures of the interior angles is 180 degrees.
10	G.CO.C.10	Triangles and Their Side Lengths	Construct or justify the construction of isosceles and equilateral triangles; determine if three given segments will satisfy the triangle inequality; determine the length or parameters for a third side of a triangle given the other two sides.
10	G.MG.A.1	Triangle Inequalities	Solve real-world problems involving relationships between the angle measures and side lengths of one or two triangles.
10	G.CO.C.10	Isosceles Triangles	Solve for unknown measures of isosceles triangles; identify characteristics of an isosceles triangle; complete the steps to prove the isosceles triangle theorem and its converse.
10	G.CO.C.10	Centroid and Orthocenter	Solve for unknown measures created by medians in a triangle; identify the characteristics of the centroid or orthocenter of a triangle; complete the steps to prove that the medians of a triangle meet at a point.

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Placement Grade	CCSS	Lesson Title	Lesson Description
10	G.CO.B.6 G.CO.B.7	Congruent Figures	Determine if figures are congruent, and, if so, identify their corresponding parts; determine unknown measures of congruent figures.
10	G.CO.A.5 G.CO.B.6 G.CO.B.8	Triangle Congruence: SAS	Using SAS, complete the steps to prove triangles are congruent, and identify the sides and angle that can be used to prove triangle congruency.
10	G.CO.A.5 G.CO.B.6 G.CO.B.8 G.CO.C.10	Triangle Congruence: ASA and AAS	Using ASA or AAS, complete the steps to prove triangles are congruen,t and identify the side and angles that can be used to prove triangle congruency.
10	G.CO.A.5 G.CO.B.6 G.CO.B.7 G.CO.B.8	Triangle Congruence: SSS and HL	Using SSS or HL, complete the steps to prove triangles are congruent, and identify the side and angles that can be used to prove triangle congruency.
10	G.SRT.B.5	Using Triangle Congruence Theorems	Complete the steps to prove angles, segments, and triangles are congruent using triangle congruence theorems and CPCTC; identify the triangle congruency theorem that can be used to prove two triangles congruent.
10	G.SRT.A.1.A G.SRT.A.1.B	Dilations	Calculate and interpret the scale factor for dilations of figures; determine the unknown measures of an image or pre-image of a dilated figure given the scale factor; verify experimentally the properties of dilations given a center and a scale factor.
10	G.SRT.A.1.A G.SRT.A.1.B G.SRT.A.2	Similar Figures	Determine if two polygons are similar using dilations; find the coordinates of the vertices of an image or pre-image of a dilated polygon given the scale factor; verify the properties of dilations, including the scale factor and slopes of corresponding line segments.
10	G.SRT.A.2 G.SRT.A.3	Triangle Similarity: AA	Complete the steps to prove triangles are similar using the AA similarity theorem; identify the composition of similarity transformations in a mapping of two triangles.
10	G.SRT.B.4 G.SRT.B.5	Triangle Similarity: SSS and SAS	Complete the steps to prove triangles are similar using SAS similarity theorem and SSS similarity theorem; identify the sides and angle that can be used to prove triangle similarity using these theorems.

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Placement Grade	CCSS	Lesson Title	Lesson Description
10	G.SRT.B.4 G.SRT.B.5	Using Triangle Similarity Theorems	Complete the steps to prove theorems involving similar triangles; solve for unknown measures of similar triangles using the side splitter theorem and its converse and using the triangle midsegment theorem.
10	G.SRT.B.4 G.SRT.B.5	Right Triangle Similarity	Apply theorems to solve problems involving geometric means; identify similar right triangles formed by an altitude, and write a similarity statement.
10	G.GPE.B.6 G.MG.A.3	Directed Line Segments and Modeling	Find the coordinates of a point on a directed line segment that partitions the segment into a given ratio; model and solve real-world problems involving directed line segments.
10	G.MG.A.1	Triangle Classification Theorems	Classify a triangle using the converse of the Pythagorean theorem and triangle inequality theorems, and apply these theorems to solve problems; determine an unknown side length or range of side lengths of a triangle given its classification.
10	G.MG.A.1	Special Right Triangles	Determine unknown measures of 30-60-90 triangles and 45-45-90 triangles; solve real-world problems involving special right triangles.
10	G.SRT.C.6 G.SRT.C.7	Trigonometric Ratios	Given an acute angle of a right triangle, label the hypotenuse, opposite, and adjacent sides, and write ratios for sine, cosine, and tangent.
10	G.SRT.C.8	Solving for Side Lengths of Right Triangles	Apply trigonometric ratios to solve real-world problems and solve for unknown side lengths of right triangles.
10	G.SRT.C.8	Solving for Angle Measures of Right Triangles	Apply inverse trigonometric functions to solve real-world problems and to solve for unknown angles of right triangles.
10	G.CO.C.11 G.MG.A.1	Classifying Quadrilaterals	Classify and describe relationships within the family of quadrilaterals; describe real-world objects and solve mathematical and real-world problems using characteristics of quadrilaterals.
10	G.CO.C.11	Parallelograms	Apply properties of parallelograms to solve problems, and complete the steps to prove theorems about these properties.
10	G.CO.C.11	Proving a Quadrilateral Is a Parallelogram	Analyze a figure to determine if it is a parallelogram; apply properties of parallelograms to solve for unknown values; complete the steps to prove that a quadrilateral is a parallelogram.

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Placement Grade	CCSS	Lesson Title	Lesson Description
10	G.CO.C.11 G.MG.A.1	Special Parallelograms	Apply properties of rhombi, rectangles, and squares to solve mathematical and real-world problems; complete the steps to prove theorems about properties of these figures.
10	G.CO.C.11 G.MG.A.1	Trapezoids and Kites	Apply properties of kites and trapezoids to solve mathematical and real-world problems; complete proofs involving properties of these figures.
10	G.GPE.B.4 G.GPE.B.7	Figures in the Coordinate Plane	Apply coordinate algebra proofs to triangles and quadrilaterals; calculate the perimeter of a triangle or quadrilateral given the coordinates of the vertices.
10	G.MG.A.1	Special Segments	Solve problems involving segments formed by a secant and a tangent that intersect outside a circle, by two intersecting chords, by two intersecting tangents, and by two secants that intersect outside a circle.
10	G.MG.A.1 G.GMD.A.1	Circumference and Arc Length	Determine the radian measure of a central angle; solve problems involving arc length with central angles measured in degrees and radians; solve problems involving circumference of a circle.
10	G.GMD.A.1	Area of a Circle and a Sector	Solve problems involving area of a sector with central angles measured in degrees and in radians.
10	G.GPE.B.4	Equation of a Circle	Determine if a given point lies on a circle; determine the equation of a circle; identify the center and radius from the equation of a circle, including equations given in general form.
10	G.GPE.B.7	Area of Triangles and Parallelograms	Solve problems involving areas of triangles and parallelograms.
10	G.GPE.B.7 G.MG.A.1	Perimeter and Area of Rhombi, Trapezoids, and Kites	Calculate the perimeter of a rhombus, trapezoid, or kite given the coordinates of the vertices; solve problems involving the area of these figures given the coordinates of the vertices.
10	G.MG.A.1	Angle Measures of Polygons	Apply the polygon interior and exterior angle sum theorems to solve problems.
10	G.SRT.C.8 G.MG.A.1	Area of Regular Polygons	Calculate the area of a regular polygon and the length of its apothem; solve real-world problems involving the area of regular polygons.

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Placement Grade	CCSS	Lesson Title	Lesson Description
10	G.MG.A.1	Area of Composite Figures	Calculate the area of composite 2-D figures, including real-world applications; decompose composite 2-D figures; write an expression that represents the area of a composite 2-D figure.
10	G.MG.A.2 G.MG.A.3	Density and Design Problems	Solve problems involving density of an area; use geometric concepts to solve design problems.
10	G.GMD.B.4	Three-Dimensional Figures and Cross Sections	Determine the 3-D figure generated by a rotation of a 2-D figure; determine the horizontal and vertical cross-sections of 3-D figures.
10	G.MG.A.1 G.MG.A.2 G.MG.A.3	Volume of Prisms	Calculate the volume or an unknown measure of an oblique prism based on a mathematical or real-world model; write expressions to represent the volumes or unknown measures of oblique prisms.
10	G.GMD.A.1 G.GMD.A.3	Volume of Pyramids	Calculate the volume or an unknown measure of a right hexagonal pyramid and an oblique pyramid based on a mathematical or real-world model; write expressions to represent the volumes or unknown measures of right hexagonal pyramids and oblique pyramids.
10	G.GMD.A.1 G.GMD.A.3	Volume of Cylinders, Cones, and Spheres	Solve mathematical and real-world problems involving the volume of oblique cones and oblique cylinders; write expressions to represent the volumes or unknown measures of cylinders and cones.
10	G.MG.A.2 G.GMD.A.3	Cavalieri's Principle and Volume of Composite Figures	Calculate the volumes of composite figures, including those that model real-world objects; write an expression to represent the volume of a composite figure.
11, 12	N.CN.A.1 N.CN.B.4	Complex Numbers	Represent square roots of negative numbers as multiples of i and complex numbers in the form a + bi or in the complex plane; simplify powers of i using their cyclic nature.
11, 12	N.CN.A.1 N.CN.A.2 N.CN.A.3	Operations with Complex Numbers	Perform addition, subtraction, and multiplication of complex numbers.
11, 12	A.SSE.A.1.A A.SSE.A.1.B A.APR.B.3	Factoring Polynomials Completely	Analyze polynomial expressions to factor them completely.

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Placement Grade	CCSS	Lesson Title	Lesson Description
11, 12	A.SSE.B.4	Summation Notation	Evaluate a summation by expanding it; convert between series in summation notation and expanded form.
11, 12	A.SSE.B.4	Summation Properties and Rules	Use summation properties and rules to evaluate sums.
11, 12	A.SSE.B.4	Finite Geometric Series	Solve problems using the formula for the sum of a finite geometric series.
11, 12	A.APR.A.1 A.APR.B.2 A.APR.B.3	Synthetic Division and the Remainder Theorem	Apply the remainder theorem; use synthetic division to divide a polynomial by a linear factor.
11, 12	A.APR.A.1	Division of Polynomials	Use long division to find quotients of polynomials; use inverse operations to check the result of polynomial division.
11, 12	A.SSE.A.1.B	The Binomial Theorem	Use the binomial theorem to expand binomials and to find a specific term in an expansion.
11, 12	A.SSE.A.1.A A.APR.B.3	Rational Roots Theorem	Determine the roots of and factor a polynomial function; use the rational root theorem to determine possible roots of a polynomial function.
11, 12	A.SSE.A.1.A A.APR.B.3	Fundamental Theorem of Algebra	Use the complex conjugate theorem to factor and solve polynomial equations, and apply the fundamental theorem of algebra to determine the number of roots of a polynomial function.
11, 12	A.SSE.A.1.A A.APR.B.3	Writing Poly Functions from Complex Roots	Write polynomial functions from complex roots.
11, 12	A.SSE.A.1.A A.APR.D.6	Simplifying Rational Expressions	Simplify rational expressions using factoring techniques, and determine their excluded values.
11, 12	A.SSE.A.1.A A.APR.D.6	Simplifying Rational Expressions by Factoring	Simplify rational expressions using factoring techniques, and determine their excluded values.
11, 12	A.SSE.A.1.B A.APR.D.7	Multiplying and Dividing Rational Expressions	Perform multiplication and division of rational expressions.

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Placement Grade	CCSS	Lesson Title	Lesson Description
11, 12	A.SSE.A.1.A A.APR.D.7	Adding and Subtracting Rational Expressions	Add and subtract rational expressions; simplify complex rational expressions containing sums or differences.
11, 12	A.APR.D.6 A.REI.A.2	Rational Equations	Solve rational equations, and determine extraneous solutions; use the equations to model and solve real-world problems.
11, 12	A.REI.A.2	Radical Equations and Extraneous Roots	Model and solve mathematical and real-world problems using radical equations, and determine extraneous roots.
11, 12	A.REI.A.2	Solving Equations Containing Two Radicals	Solve equations containing two radicals, and determine extraneous solutions
11, 12	F.IF.B.4 F.IF.B.5 F.IF.C.7.D	Graphs of Rational Functions	Use algebraic techniques to determine key features of a rational function; graph a rational function, and analyze its key features.
11, 12	F.IF.B.4 F.IF.B.5 F.IF.C.7.C	Graphs of Polynomial Functions	Describe the key features of a polynomial function, and identify these features from a given graph.
11, 12	F.IF.B.4 F.IF.B.5 F.IF.C.7.C	Graphing Polynomial Functions	Graph polynomial functions using key features.
11, 12	F.IF.B.4 F.IF.C.7.C	Functions and Transformations	Describe the effect of one or more transformations on the graph of a function; write the equation of a transformed function given its graph; recognize even and odd functions.
11, 12	F.TF.A.1 F.TF.A.2 F.TF.A.3	Angles and Trigonometric Functions	Convert between radian and degree measure; evaluate trigonometric functions, and use them to solve problems; use the unit circle to explain key features of the sine and cosine functions.
11, 12	G.SRT.D.10 G.SRT.D.11	Law of Sines	Apply the law of sines to solve mathematical and real-world problems.
11, 12	G.SRT.D.10 G.SRT.D.11	Law of Cosines	Apply the law of cosines to solve mathematical and real-world problems.

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Placement Grade	CCSS	Lesson Title	Lesson Description
11, 12	G.SRT.D.9	Area and Perimeter of Triangles	Solve area and perimeter problems using A = 1/2absinC and Heron's formula; derive the area formula A = 1/2absinC.
11, 12	F.IF.B.4 F.IF.B.5 F.IF.C.7.A	Parabolas	Determine the equation of a parabola given the focus and directrix.
11, 12	A.SSE.A.1.B F.IF.C.8.B	Solving Exponential Equations by Rewriting the Base	Solve exponential equations by rewriting bases.
11, 12	A.SSE.A.1.B	Evaluating Logarithmic Expressions	Evaluate and solve logarithmic expressions by converting between logarithmic and exponential forms.
11, 12	A.SSE.A.1.B	Properties of Logarithms	Expand, simplify, and evaluate logarithmic expressions using properties of logarithms.
11, 12	A.SSE.A.1.B A.REI.A.2 F.IF.C.8.B	Solving Equations Using Properites of Logarithms	Apply properties of logarithms to solve logarithmic equations; determine extraneous solutions of the equations.
11, 12	A.SSE.A.1.B	Base e	Analyze exponential and logarithmic functions in base e to determine key features of the graph; apply properties of logarithms and exponents to solve exponential and logarithmic equations having base e; determine the domain and range of exponential and logarithmic functions in base e.
11, 12	A.SSE.A.1.B A.REI.A.2	Solving Exponential and Logarithmic Equations	Solve exponential and logarithmic equations using inverses, properties, and algorithms.