Imagine
Math

BUILT for
Florida

2016-2017
Florida Learning Pathways

Imagine Learning®

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Grade 3
Florida Learning Pathway

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations in Base Ten	Visualizing Whole Numbers	n/a	In this introductory lesson, students will: • Review valuable content. • Explore TTM features. • Prepare for success on grade-level material.
	Visualizing Place Value	n/a	In this introductory lesson, students will: • Review valuable content. • Explore TTM features. • Prepare for success on grade-level material.
Operations and Algebraic Thinking	Visualizing Addition	n/a	In this introductory lesson, students will: • Review valuable content. • Explore TTM features. • Prepare for success on grade-level material.
	Visualizing Subtraction	n/a	In this introductory lesson, students will: • Review valuable content. • Explore TTM features. • Prepare for success on grade-level material.
	Structuring Within 5 and Composing 10	n/a	In this lesson, students will: • Practice a variety of methods that reflect those of mathematically fluent thinkers. • Prepare for success on grade-level material.
	Structuring within 10	n/a	In this lesson, students will: • Practice a variety of methods that reflect those of mathematically fluent thinkers. • Prepare for success on grade-level material.
	Structuring within 20	n/a	In this lesson, students will: • Practice a variety of methods that reflect those of mathematically fluent thinkers. • Prepare for success on grade-level material.
	Structuring within 100	n/a	In this lesson, students will: • Practice a variety of methods that reflect those of mathematically fluent thinkers. • Prepare for success on grade-level material.
Number and Operations in Base Ten	Structuring within 1,000	n/a	In this lesson, students will: • Practice a variety of methods that reflect those of mathematically fluent thinkers. • Prepare for success on grade-level material.

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Unit	Lesson Name	Standard Code	Standard Description
Operations and Algebraic Thinking	Concept of Multiplication - Grouping	MAFS.3.OA.1.1	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 x 7.
	Concept of Multiplication - Word Problems	MAFS.3.OA.1.1	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 x 7.
	Concept of Multiplication - Arrays	MAFS.3.OA.1.1	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 x 7.
	Properties of Addition and Multiplication	MAFS.3.OA.2.5	Operations and Algebraic Thinking. Understand properties of multiplication and the relationship between multiplication and division. Apply properties of operations as strategies to multiply and divide. Examples: If 6 x 4 = 24 is known, then 4 x 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56. (Distributive property.)
	Concept of Division	MAFS.3.OA.1.2	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.
	Interpreting Division Problems	MAFS.3.OA.1.2	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.
	Constructing Division Problems	MAFS.3.OA.1.2	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.
	Relationship Between Multiplication and Division	MAFS.3.OA.2.5	Operations and Algebraic Thinking. Understand properties of multiplication and the relationship between multiplication and division. Apply properties of operations as strategies to multiply and divide. Examples: If 6 x 4 = 24 is known, then 4 x 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56. (Distributive property.)

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Unit	Lesson Name	Standard Code	Standard Description
Operations and Algebraic Thinking (continued)	Multiplication and Division Fact Families	MAFS.3.OA.2.5	Operations and Algebraic Thinking. Understand properties of multiplication and the relationship between multiplication and division. Apply properties of operations as strategies to multiply and divide. Examples: If 6 x 4 = 24 is known, then 4 x 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56. (Distributive property.)
		MAFS.3.OA.2.6	Operations and Algebraic Thinking. Understand properties of multiplication and the relationship between multiplication and division. Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.
		MAFS.3.OA.3.7	Operations and Algebraic Thinking. Multiply and divide within 100. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 =40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
	Solving Multiplication and Division Equations	MAFS.3.OA.1.4	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = [] ÷ 3, 6 x 6 = ?.
		MAFS.3.OA.2.6	Operations and Algebraic Thinking. Understand properties of multiplication and the relationship between multiplication and division. Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.
	Division as an Unknown-Factor Problem	MAFS.3.OA.1.4	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = [] ÷ 3, 6 x 6 = ?.
		MAFS.3.OA.2.6	Operations and Algebraic Thinking. Understand properties of multiplication and the relationship between multiplication and division. Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.
	Multiplication and Division Word Problems - Visual Models	MAFS.3.OA.1.3	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
	Multiplication and Division Word Problems - Equations	MAFS.3.OA.1.3	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

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Unit	Lesson Name	Standard Code	Standard Description
Operations and Algebraic Thinking (continued)	Multiplication and Division Word Problems - Solutions	MAFS.3.OA.1.3	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
Number and Operations in Base Ten	Multiplying by Multiples of Ten	MAFS.3.OA.1.3	Operations and Algebraic Thinking. Represent and solve problems involving multiplication and division. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
	Reasoning About Place Value and Rounding	MAFS.3.NBT.1.1	Number and Operations in Base Ten. Use place value understanding and properties of operations to perform multi-digit arithmetic. Use place value understanding to round whole numbers to the nearest 10 or 100.
	Rounding to the Nearest Ten and Hundred	MAFS.3.NBT.1.1	Number and Operations in Base Ten. Use place value understanding and properties of operations to perform multi-digit arithmetic. Use place value understanding to round whole numbers to the nearest 10 or 100.
Operations and Algebraic Thinking	Estimating Sums and Differences - Application	MAFS.3.OA.4.8	Operations and Algebraic Thinking. Solve problems involving the four operations, and identify and explain patterns in arithmetic. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
Number and Operations in Base Ten	Reasoning About Addition and Subtraction Within 1,000	MAFS.3.NBT.1.2	Number and Operations in Base Ten. Use place value understanding and properties of operations to perform multi-digit arithmetic. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
Operations and Algebraic Thinking	Solving Two-Step Word Problems	MAFS.3.OA.4.8	Operations and Algebraic Thinking. Solve problems involving the four operations, and identify and explain patterns in arithmetic. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
	Modeling and Solving Two-Step Word Problems	MAFS.3.OA.4.8	Operations and Algebraic Thinking. Solve problems involving the four operations, and identify and explain patterns in arithmetic. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations- Fractions	Understanding Fractions - Equal Areas	MAFS.3.NF.1.1	Number and Operations-Fractions. Develop understanding of fractions as numbers. Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.
	Understanding Fractions - Notation	MAFS.3.G.1.2	Geometry. Reason with shapes and their attributes. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.
	Unit Fractions on the Number Line	MAFS.3.NF.1.2.a	Number and Operations-Fractions. Develop understanding of fractions as numbers. Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.
	Fractions on the Number Line	MAFS.3.NF.1.2.b	Number and Operations-Fractions. Develop understanding of fractions as numbers. Understand a fraction as a number on the number line; represent fractions on a number line diagram. b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.
	Modeling Equivalent Fractions with Number Lines	MAFS.3.NF.1.3.a	Number and Operations-Fractions. Develop understanding of fractions as numbers. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
	Visual Models of Equivalent Fractions	MAFS.3.NF.1.3.b	Number and Operations-Fractions. Develop understanding of fractions as numbers. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model
	Whole Numbers as Fractions	MAFS.3.NF.1.3.c	Number and Operations-Fractions. Develop understanding of fractions as numbers. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.
	Whole Numbers as Fractions on the Number Line	MAFS.3.NF.1.3.c	Number and Operations-Fractions. Develop understanding of fractions as numbers. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations- Fractions (continued)	Comparing Fractions with the Same Numerator or Denominator	MAFS.3.NF.1.3.d	Number and Operations-Fractions. Develop understanding of fractions as numbers. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
	Recognizing Valid Fraction Comparisons I	MAFS.3.NF.1.3.d	Number and Operations-Fractions. Develop understanding of fractions as numbers. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Unit	Lesson Name	Standard Code	Standard Description
Measurement and Data	Unit Squares	MAFS.3.MD.3.5.a	Measurement and Data. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Recognize area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
		MAFS.3.MD.3.6	Measurement and Data. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
	Concept of Area	MAFS.3.MD.3.5.a	Measurement and Data. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Recognize area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
		MAFS.3.MD.3.5.b	Measurement and Data. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Recognize area as an attribute of plane figures and understand concepts of area measurement. b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.
		MAFS.3.MD.3.6	Measurement and Data. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
	Area of Rectangles	MAFS.3.MD.3.7.a	Measurement and Data. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Relate area to the operations of multiplication and addition. a. 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.
		MAFS.3.MD.3.7.b	Measurement and Data. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Relate area to the operations of multiplication and addition. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
Measurement and Data (continued)	Area of Rectangles (continued)	MAFS.3.MD.3.7.c	Measurement and Data. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Relate area to the operations of multiplication and addition. c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a x b and a x c. Use area models to represent the distributive property in mathematical reasoning.
	Recognizing Area as Additive	MAFS.3.MD.3.7.d	Measurement and Data. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Relate area to the operations of multiplication and addition. d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

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Unit	Lesson Name	Standard Code	Standard Description
Operations and Algebraic Thinking	Using Visual Models to Understand the Distributive Property	MAFS.3.OA.2.5	Operations and Algebraic Thinking. Understand properties of multiplication and the relationship between multiplication and division. Apply properties of operations as strategies to multiply and divide. Examples: If 6 x 4 = 24 is known, then 4 x 6 = 24 is also known. (Commutative property of multiplication.) 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30. (Associative property of multiplication.) Knowing that 8 x 5 = 40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5 + 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56. (Distributive property.)
Measurement and Data	Area of Basic Composite Figures	MAFS.3.MD.3.7.d	Measurement and Data. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Relate area to the operations of multiplication and addition. d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.
	Perimeter	MAFS.3.MD.4.8	Measurement and Data. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
Geometry	Classifying Quadrilaterals I	MAFS.3.G.1.1	Geometry. Reason with shapes and their attributes. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
Measurement and Data	Capacity or Weight	MAFS.3.MD.1.2	Measurement and Data. Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units.

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Unit	Lesson Name	Standard Code	Standard Description
Measurement and Data (continued)	Money Sense	MAFS.2.MD.3.8.a	Measurement and Data. Work with time and money. Solve one- and two-step word problems involving dollar bills (singles, fives, tens, twenties, and hundreds) or coins (quarters, dimes, nickels, and pennies) using $ and ¢ symbols appropriately. Word problems may involve addition, subtraction, and equal groups situations. Example: The cash register shows that the total for your purchase is 59¢. You gave the cashier three quarters. How much change should you receive from the cashier? a. Identify the value of coins and paper currency.
	Adding and Subtracting Time	MAFS.3.MD.1.1	Measurement and Data. Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
	Introduction to Data Displays	MAFS.3.MD.2.3	Measurement and Data. Represent and interpret data. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.
Operations and Algebraic Thinking	Additive and Multiplicative Patterns	MAFS.3.OA.4.9	Operations and Algebraic Thinking. Solve problems involving the four operations, and identify and explain patterns in arithmetic. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

Grade 4
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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations in Base Ten	Visualizing Place Value Relationships	n/a	In this introductory lesson, students will: • Review valuable content. • Explore TTM features. • Prepare for success on grade-level material.
	Visualizing Rounding	n/a	In this introductory lesson, students will: • Review valuable content. • Explore TTM features. • Prepare for success on grade-level material.
Operations and Algebraic Thinking	Visualizing Addition and Subtraction	n/a	In this introductory lesson, students will: • Review valuable content. • Explore TTM features. • Prepare for success on grade-level material.
	Visualizing Multiplication and Division	n/a	In this introductory lesson, students will: • Review valuable content. • Explore TTM features. • Prepare for success on grade-level material.
	Developing Fluency Using 2 as a Factor	n/a	In this lesson, students will: • Practice a variety of methods that reflect those of mathematically fluent thinkers. • Prepare for success on grade-level material.
	Developing Fluency Using 5 or 10 as a Factor	n/a	In this lesson, students will: • Practice a variety of methods that reflect those of mathematically fluent thinkers. • Prepare for success on grade-level material.
	Using Halves and Doubles to Solve Multiplication Problems	n/a	In this lesson, students will: • Practice a variety of methods that reflect those of mathematically fluent thinkers. • Prepare for success on grade-level material.
Number and Operations in Base Ten	Adding Whole Numbers	MAFS.4.NBT.2.4	Number and Operations in Base Ten. Use place value understanding and properties of operations to perform multi-digit arithmetic. Fluently add and subtract multi-digit whole numbers using the standard algorithm.
	Adding and Subtracting with the Standard Algorithm	MAFS.4.NBT.2.4	Number and Operations in Base Ten. Use place value understanding and properties of operations to perform multi-digit arithmetic. Fluently add and subtract multi-digit whole numbers using the standard algorithm.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations in Base Ten (continued)	Using Place Value Concepts to Compare Whole Numbers	MAFS.4.NBT.1.2	Number and Operations in Base Ten. Generalize place value understanding for multi-digit whole numbers. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
	Understanding Place Value Relationships	MAFS.4.NBT.1.1	Number and Operations in Base Ten. Generalize place value understanding for multi-digit whole numbers. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.
	Rounding Whole Numbers	MAFS.4.NBT.1.3	Number and Operations in Base Ten. Generalize place value understanding for multi-digit whole numbers. Use place value understanding to round multi-digit whole numbers to any place.
	Using Rounding in Problem Solving	MAFS.4.NBT.1.3	Number and Operations in Base Ten. Generalize place value understanding for multi-digit whole numbers. Use place value understanding to round multi-digit whole numbers to any place.
	Multiplying Whole Numbers	MAFS.4.NBT.2.5	Number and Operations in Base Ten. Use place value understanding and properties of operations to perform multi-digit arithmetic. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
Operations and Algebraic Thinking	Multiplication as a Comparison - Equations	MAFS.4.OA.1.2	Operations and Algebraic Thinking. Use the four operations with whole numbers to solve problems. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
	Multiplication as a Comparison - Word Problems	MAFS.4.OA.1.1	Operations and Algebraic Thinking. Use the four operations with whole numbers to solve problems. Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
Number and Operations in Base Ten	Dividing Whole Numbers - One-Digit Divisors	MAFS.4.NBT.2.6	Number and Operations in Base Ten. Use place value understanding and properties of operations to perform multi-digit arithmetic. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
Operations and Algebraic Thinking	Interpreting Remainders	MAFS.4.OA.1.3	Operations and Algebraic Thinking. Use the four operations with whole numbers to solve problems. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations in Base Ten	Estimating Solutions to Multistep Word Problems	MAFS.4.OA.1.3	Operations and Algebraic Thinking. Use the four operations with whole numbers to solve problems. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
Operations and Algebraic Thinking	Factors	MAFS.4.OA.2.4.c	Operations and Algebraic Thinking. Gain familiarity with factors and multiples. Investigate factors and multiples. c. Determine whether a given whole number in the range 1-100 is prime or composite.
	Relating Factors and Multiples I	MAFS.4.OA.2.4.a	Operations and Algebraic Thinking. Gain familiarity with factors and multiples. Investigate factors and multiples. a. Find all factor pairs for a whole number in the range 1-100.
		MAFS.4.OA.2.4.b	Operations and Algebraic Thinking. Gain familiarity with factors and multiples. Investigate factors and multiples. b. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number.
	Relating Factors and Multiples II	MAFS.4.OA.2.4.a	Operations and Algebraic Thinking. Gain familiarity with factors and multiples. Investigate factors and multiples. a. Find all factor pairs for a whole number in the range 1-100.
		MAFS.4.OA.2.4.b	Operations and Algebraic Thinking. Gain familiarity with factors and multiples. Investigate factors and multiples. b. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations- Fractions	Modeling Equivalent Fractions	MAFS.4.NF.1.1	Number and Operations-Fractions. Extend understanding of fraction equivalence and ordering. Explain why a fraction a/b is equivalent to a fraction (n x a)/(n x b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
	Generating Equivalent Fractions	MAFS.4.NF.1.1	Number and Operations-Fractions. Extend understanding of fraction equivalence and ordering. Explain why a fraction a/b is equivalent to a fraction (n x a)/(n x b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
	Reducing Fractions	MAFS.4.NF.1.1	Number and Operations-Fractions. Extend understanding of fraction equivalence and ordering. Explain why a fraction a/b is equivalent to a fraction (n x a)/(n x b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
	Comparing Fractions - Visual Models	MAFS.4.NF.1.2	Number and Operations-Fractions. Extend understanding of fraction equivalence and ordering. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. 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, e.g., by using a visual fraction model.
	Comparing Fractions with Different Numerators and Different Denominators	MAFS.4.NF.1.2	Number and Operations-Fractions. Extend understanding of fraction equivalence and ordering. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. 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, e.g., by using a visual fraction model.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations- Fractions (continued)	Recognizing Valid Fraction Comparisons II	MAFS.4.NF.1.2	Number and Operations-Fractions. Extend understanding of fraction equivalence and ordering. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. 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, e.g., by using a visual fraction model.
	Adding and Subtracting Fractions with Like Denominators	MAFS.4.NF.2.3.a	Number and Operations-Fractions. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Understand a fraction a/b with a > 1 as a sum of fractions 1/b. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
	Adding and Subtracting Fractions with Like Denominators in Real-World Situations	MAFS.4.NF.2.3.a	Number and Operations-Fractions. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Understand a fraction a/b with a > 1 as a sum of fractions 1/b. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
	Decomposing Fractions and Mixed Numbers	MAFS.4.NF.2.3.b	Number and Operations-Fractions. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Understand a fraction a/b with a > 1 as a sum of fractions 1/b. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.
	Writing Fractions as Mixed Numbers and Mixed Numbers as Fractions	MAFS.4.NF.2.3.b	Number and Operations-Fractions. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Understand a fraction a/b with a > 1 as a sum of fractions 1/b. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.
	Understanding Fractions - Relationship Between Numerator and Denominator	MAFS.4.NF.1.1	Number and Operations-Fractions. Extend understanding of fraction equivalence and ordering. Explain why a fraction a/b is equivalent to a fraction (n x a)/(n x b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
	Word Problems with Fractions and Mixed Numbers - Visual Models	MAFS.4.NF.2.3.d	Number and Operations-Fractions. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Understand a fraction a/b with a > 1 as a sum of fractions 1/b. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations- Fractions (continued)	Word Problems with Fractions and Mixed Numbers - Estimation	MAFS.4.NF.2.3.d	Number and Operations-Fractions. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Understand a fraction a/b with a > 1 as a sum of fractions 1/b. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
	Adding and Subtracting Mixed Numbers with Like Denominators - Conceptual Strategies	MAFS.4.NF.2.3.c	Number and Operations-Fractions. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Understand a fraction a/b with a > 1 as a sum of fractions 1/b. c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
	Adding and Subtracting Mixed Numbers with Like Denominators	MAFS.4.NF.2.3.c	Number and Operations-Fractions. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Understand a fraction a/b with a > 1 as a sum of fractions 1/b. c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
	Multiplying Unit Fractions by Whole Numbers	MAFS.4.NF.2.4.a	Number and Operations-Fractions. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 x (1/4), recording the conclusion by the equation 5/4 = 5 x (1/4).
	Multiplying Fractions by Whole Numbers	MAFS.4.NF.2.4.b	Number and Operations-Fractions. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 x (2/5) as 6 x (1/5), recognizing this product as 6/5. (In general, n x (a/b) = (n x a)/b.)
	Solving Word Problems with Multiplication of Fractions by Whole Numbers	MAFS.4.NF.2.4.c	Number and Operations-Fractions. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?
	Understanding Fractions with Denominators of 10 and 100	MAFS.4.NF.3.5	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations- Fractions (continued)	Adding Fractions with Denominators of 10 or 100	MAFS.4.NF.3.5	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.
	Comparing Decimal Fractions	MAFS.4.NF.3.6	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
Number and Operations in Base Ten	Comparing and Ordering Decimal Fractions	MAFS.4.NF.3.6	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
	Decimal Notation I	MAFS.4.NF.3.6	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
	Decimal Notation II	MAFS.4.NF.3.6	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
Number and Operations- Fractions	Decimals to Hundredths	MAFS.4.NF.3.7	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
Number and Operations in Base Ten	Introduction to Comparing Decimals to Hundredths	MAFS.4.NF.3.7	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
	Comparing Decimals to Hundredths	MAFS.4.NF.3.7	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations- Fractions	Recognizing Valid Decimal Comparisons	MAFS.4.NF.3.7	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
Number and Operations in Base Ten	Fraction and Decimal Equivalents	MAFS.5.NBT.1.3.a	Number and Operations in Base Ten. Understand the place value system. Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
	Comparing Fractions and Decimals	MAFS.4.NF.3.6	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
		MAFS.5.NBT.1.3.a	Number and Operations in Base Ten. Understand the place value system. Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.

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Unit	Lesson Name	Standard Code	Standard Description
Measurement and Data	Area and Perimeter of Rectangles	MAFS.4.MD.1.3	Measurement and Data. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.
	Identifying and Comparing Angles	MAFS.4.MD.3.5	Measurement and Data. Geometric measurement: understand concepts of angle and measure angles. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.
	Angles	MAFS.4.MD.3.5.a	Measurement and Data. Geometric measurement: understand concepts of angle and measure angles. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.
		MAFS.4.MD.3.5.b	Measurement and Data. Geometric measurement: understand concepts of angle and measure angles. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
		MAFS.4.MD.3.6	Measurement and Data. Geometric measurement: understand concepts of angle and measure angles. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
		MAFS.4.MD.3.7	Measurement and Data. Geometric measurement: understand concepts of angle and measure angles. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

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Unit	Lesson Name	Standard Code	Standard Description
Geometry	Identifying and Classifying Lines, Rays, and Segments	MAFS.4.G.1.1	Geometry. Draw and identify lines and angles, and classify shapes by properties of their lines and angles. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
	Classifying Tri-angles	MAFS.4.G.1.1	Geometry. Draw and identify lines and angles, and classify shapes by properties of their lines and angles. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
		MAFS.4.G.1.2	Geometry. Draw and identify lines and angles, and classify shapes by properties of their lines and angles. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
	Classifying Quadrilaterals II	MAFS.4.G.1.1	Geometry. Draw and identify lines and angles, and classify shapes by properties of their lines and angles. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
		MAFS.4.G.1.2	Geometry. Draw and identify lines and angles, and classify shapes by properties of their lines and angles. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
		MAFS.5.G.2.3	Geometry. Classify two-dimensional figures into categories based on their properties. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.
		MAFS.5.G.2.4	Geometry. Classify two-dimensional figures into categories based on their properties. Classify and organize two-dimensional figures into Venn diagrams based on the attributes of the figures.
	Symmetry	MAFS.4.G.1.3	Geometry. Draw and identify lines and angles, and classify shapes by properties of their lines and angles. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.
Measurement and Data	Units of Measure - Customary	MAFS.4.MD.1.1	Measurement and Data. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...
	Units of Measure - Metric	MAFS.4.MD.1.1	Measurement and Data. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...

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Unit	Lesson Name	Standard Code	Standard Description
Operations and Algebraic Thinking	Generating and Describing Number Patterns	MAFS.4.OA.3.5	Operations and Algebraic Thinking. Generate and analyze patterns. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations in Base Ten	Operations with Whole Numbers - Mixed Practice	MAFS.5.NBT.2.5	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Fluently multiply multi-digit whole numbers using the standard algorithm.
	Multiplying Whole Numbers - Standard Algorithm	MAFS.5.NBT.2.5	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Fluently multiply multi-digit whole numbers using the standard algorithm.
	Dividing Whole Numbers - Two-Digit Divisors	MAFS.5.NBT.2.6	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations- Fractions	Understanding Fractions as Division	MAFS.5.NF.2.3	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?
	Adding Fractions	MAFS.5.NF.1.1	Number and Operations-Fractions. Use equivalent fractions as a strategy to add and subtract fractions. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)
	Adding Fractions - Estimation Strategies	MAFS.5.NF.1.2	Number and Operations-Fractions. Use equivalent fractions as a strategy to add and subtract fractions. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.
	Subtracting Fractions	MAFS.5.NF.1.1	Number and Operations-Fractions. Use equivalent fractions as a strategy to add and subtract fractions. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)
	Subtracting Fractions - Estimation Strategies	MAFS.5.NF.1.2	Number and Operations-Fractions. Use equivalent fractions as a strategy to add and subtract fractions. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations- Fractions (continued)	Understanding Products with Fractions	MAFS.5.NF.2.4.a	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product (a/b) x q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a x q ÷ b. For example, use a visual fraction model to show (2/3) x 4 = 8/3, and create a story context for this equation. Do the same with (2/3) x (4/5) = 8/15. (In general, (a/b) x (c/d) = ac/bd.)
		MAFS.5.NF.2.5.a	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. Interpret multiplication as scaling (resizing), by: a. Comparing 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.
		MAFS.5.NF.2.5.b	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. Interpret multiplication as scaling (resizing), by: b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b =(n x a)/(n x b) to the effect of multiplying a/b by 1.
	Multiplying Fractions by Fractions	MAFS.5.NF.2.4.a	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product (a/b) x q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a x q ÷ b. For example, use a visual fraction model to show (2/3) x 4 = 8/3, and create a story context for this equation. Do the same with (2/3) x (4/5) = 8/15. (In general, (a/b) x (c/d) = ac/bd.)
		MAFS.5.NF.2.4.b	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
	Multiplying with Fractions and Mixed Numbers	MAFS.5.NF.2.6	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations- Fractions (continued)	Adding and Subtracting Fractions	MAFS.5.NF.1.1	Number and Operations-Fractions. Use equivalent fractions as a strategy to add and subtract fractions. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)
		MAFS.5.NF.1.2	Number and Operations-Fractions. Use equivalent fractions as a strategy to add and subtract fractions. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.
	Adding and Subtracting Fractions - Multistep Word Problems	MAFS.5.NF.1.1	Number and Operations-Fractions. Use equivalent fractions as a strategy to add and subtract fractions. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)
		MAFS.5.NF.1.2	Number and Operations-Fractions. Use equivalent fractions as a strategy to add and subtract fractions. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.
	Multiplying Fractions by Whole Numbers to Solve Multistep Problems	MAFS.5.NF.2.6	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
	Dividing Unit Fractions by Whole Numbers	MAFS.5.NF.2.7.a	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.
		MAFS.5.NF.2.7.c	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations- Fractions (continued)	Dividing Whole Numbers by Unit Fractions	MAFS.5.NF.2.7.b	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. b. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.
		MAFS.5.NF.2.7.c	Number and Operations-Fractions. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?
Number and Operations in Base Ten	Decimals to Thousandths	MAFS.5.NBT.1.3.a	Number and Operations in Base Ten. Understand the place value system. Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3$ x $100 + 4$ x $10 + 7$ x $1 + 3$ x $(1/10) + 9$ x $(1/100) + 2$ x $(1/1000)$.
	Comparing Decimals to Thousandths	MAFS.5.NBT.1.3.b	Number and Operations in Base Ten. Understand the place value system. Read, write, and compare decimals to thousandths. b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
	Fraction and Decimal Equivalents	MAFS.5.NBT.1.3.a	Number and Operations in Base Ten. Understand the place value system. Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3$ x $100 + 4$ x $10 + 7$ x $1 + 3$ x $(1/10) + 9$ x $(1/100) + 2$ x $(1/1000)$.
	Comparing Fractions and Decimals	MAFS.4.NF.3.6	Number and Operations-Fractions. Understand decimal notation for fractions, and compare decimal fractions. Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
		MAFS.5.NBT.1.3.a	Number and Operations in Base Ten. Understand the place value system. Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3$ x $100 + 4$ x $10 + 7$ x $1 + 3$ x $(1/10) + 9$ x $(1/100) + 2$ x $(1/1000)$.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations in Base Ten (continued)	Rounding Decimals to the Nearest Tenth and Hundredth	MAFS.5.NBT.1.4	Number and Operations in Base Ten. Understand the place value system. Use place value understanding to round decimals to any place.
	Reasoning About Rounding Decimals	MAFS.5.NBT.1.4	Number and Operations in Base Ten. Understand the place value system. Use place value understanding to round decimals to any place.
	Adding and Subtracting Decimals	MAFS.5.NBT.2.7	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
		MAFS.6.NS.2.3	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
	Adding and Subtracting Decimals in Real-World Situations	MAFS.5.NBT.2.7	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
		MAFS.6.NS.2.3	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
	Multiplying by Powers of Ten	MAFS.5.NBT.1.2	Number and Operations in Base Ten. Understand the place value system. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
	Multiplying and Dividing by Powers of Ten	MAFS.5.NBT.1.2	Number and Operations in Base Ten. Understand the place value system. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
	Place Value Relationships Within Whole Numbers and Decimals	MAFS.5.NBT.1.1	Number and Operations in Base Ten. Understand the place value system. Recognize 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.
	Multiplying Decimals to Hundredths	MAFS.5.NBT.2.7	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations in Base Ten (continued)	Dividing Decimals to Hundredths	MAFS.5.NBT.2.7	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
	Using Reasoning and Estimation to Calculate with Decimals	MAFS.5.NBT.2.7	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
		MAFS.6.NS.2.3	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
	Calculating with Decimals	MAFS.5.NBT.2.7	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
		MAFS.6.NS.2.3	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
Expressions and Equations	Evaluating Simple Expressions	MAFS.5.OA.1.1	Operations and Algebraic Thinking. Write and interpret numerical expressions. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
		MAFS.6.EE.1.2.c	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Write, read, and evaluate expressions in which letters stand for numbers. c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6\ s^2$ to find the volume and surface area of a cube with sides of length s = 1/2.
Operations and Algebraic Thinking	Writing Simple Expressions	MAFS.5.OA.1.2	Operations and Algebraic Thinking. Write and interpret numerical expressions. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7). Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.
	Writing and Interpreting Simple Expressions	MAFS.5.OA.1.2	Operations and Algebraic Thinking. Write and interpret numerical expressions. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7). Recognize that 3 x (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.

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Unit	Lesson Name	Standard Code	Standard Description
Geometry	Introduction to the Coordinate Plane	MAFS.5.G.1.1	Geometry. Graph points on the coordinate plane to solve real-world and mathematical problems. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
	Representing Real-World Quantities in the First Quadrant	MAFS.5.G.1.2	Geometry. Graph points on the coordinate plane to solve real-world and mathematical problems. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
	Introduction to Scatter Plots	MAFS.6.SP.2.4	Statistics and Probability. Summarize and describe distributions. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

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Unit	Lesson Name	Standard Code	Standard Description
Measurement and Data	Volume of Rectangular Prisms I	MAFS.5.MD.3.3.a	Measurement and Data. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.
		MAFS.5.MD.3.3.b	Measurement and Data. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. Recognize volume as an attribute of solid figures and understand concepts of volume measurement. b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.
		MAFS.5.MD.3.4	Measurement and Data. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
	Volume of Rectangular Prisms II	MAFS.5.MD.3.5.a	Measurement and Data. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. Find the volume of a right 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, equivalent by multiplying height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
		MAFS.5.MD.3.5.b	Measurement and Data. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. b. Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
		MAFS.5.MD.3.5.c	Measurement and Data. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

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Unit	Lesson Name	Standard Code	Standard Description
Geometry	Classifying Triangles	MAFS.4.G.1.2	Geometry. Draw and identify lines and angles, and classify shapes by properties of their lines and angles. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
		MAFS.4.G.1.1	Geometry. Draw and identify lines and angles, and classify shapes by properties of their lines and angles. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
	Classifying 2-Dimensional Figures	MAFS.5.G.2.3	Geometry. Classify two-dimensional figures into categories based on their properties. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.
		MAFS.5.G.2.4	Geometry. Classify two-dimensional figures into categories based on their properties. Classify and organize two-dimensional figures into Venn diagrams based on the attributes of the figures.
Measurement and Data	Line Plots	MAFS.5.MD.2.2	Measurement and Data. Represent and interpret data. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

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Unit	Lesson Name	Standard Code	Standard Description
Number and Operations in Base Ten	Dividing Whole Numbers - Standard Algorithm	MAFS.6.NS.2.2	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Fluently divide multi-digit numbers using the standard algorithm.
	Adding and Subtracting Decimals	MAFS.5.NBT.2.7	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
		MAFS.6.NS.2.3	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
	Adding and Subtracting Decimals in Real-World Situations	MAFS.5.NBT.2.7	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
		MAFS.6.NS.2.3	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
	Using Reasoning and Estimation to Calculate with Decimals	MAFS.5.NBT.2.7	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
		MAFS.6.NS.2.3	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
	Calculating with Decimals	MAFS.5.NBT.2.7	Number and Operations in Base Ten. Perform operations with multi-digit whole numbers and with decimals to hundredths. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
		MAFS.6.NS.2.3	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Unit	Lesson Name	Standard Code	Standard Description
The Number System	Greatest Common Factor	MAFS.6.NS.2.4	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).
	Greatest Common Factor - Applications	MAFS.6.NS.2.4	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).
	Least Common Multiple	MAFS.6.NS.2.4	The Number System. Compute fluently with multi-digit numbers and find common factors and multiples. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).
	Using the Relationship Between Multiplication and Division to Divide Fractions	MAFS.6.NS.1.1	The Number System. Apply and extend previous understandings of multiplication and division to divide fractions by fractions. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?
	Dividing Fractions by Fractions	MAFS.6.NS.1.1	The Number System. Apply and extend previous understandings of multiplication and division to divide fractions by fractions. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?
	Using Division of Fractions to Represent and Solve Problems	MAFS.6.NS.1.1	The Number System. Apply and extend previous understandings of multiplication and division to divide fractions by fractions. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?

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Unit	Lesson Name	Standard Code	Standard Description
The Number System (continued)	Operations with Fractions - Mixed Practice	MAFS.6.NS.1.1	The Number System. Apply and extend previous understandings of multiplication and division to divide fractions by fractions. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?
Ratios and Proportional Relationships	Identifying Ratios	MAFS.6.RP.1.2	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."
	Ratios	MAFS.6.RP.1.1	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."
		MAFS.6.RP.1.3.a	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
	Concept of Ratios and Rates	MAFS.6.RP.1.1	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."
		MAFS.6.RP.1.2	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."
	Using Ratios to Solve Problems	MAFS.6.RP.1.3.a	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

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Unit	Lesson Name	Standard Code	Standard Description
Ratios and Proportional Relationships (continued)	Identifying Unit Rates	MAFS.6.RP.1.1	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."
		MAFS.6.RP.1.2	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."
	Solving Problems with Unit Rates	MAFS.6.RP.1.1	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."
		MAFS.6.RP.1.2	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."
		MAFS.6.RP.1.3.b	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?
	Converting Units of Measure I	MAFS.6.RP.1.3.d	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
	Converting Units of Measure II	MAFS.6.RP.1.3.d	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
	Distance, Rate, and Time	MAFS.6.RP.1.3.b	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?

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Unit	Lesson Name	Standard Code	Standard Description
Ratios and Proportional Relationships (continued)	Percent Concepts	MAFS.6.RP.1.3.c	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
	Reasoning with Percents	MAFS.6.RP.1.3.c	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
	Calculations with Percent	MAFS.6.RP.1.3.c	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
The Number System	Integer Concepts	MAFS.6.NS.3.5	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
		MAFS.6.NS.3.6.c	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
	Integer Concepts with a Number Line	MAFS.6.NS.3.6.a	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3) = 3, and that 0 is its own opposite
		MAFS.6.NS.3.6.c	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

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Unit	Lesson Name	Standard Code	Standard Description
The Number System (continued)	Integers in the Coordinate Plane I	MAFS.6.NS.3.6.b	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
	Integers in the Coordinate Plane II	MAFS.6.NS.3.6.b	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
	Comparing Rational Numbers I	MAFS.6.NS.3.6.c	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
	Comparing Rational Numbers II	MAFS.6.NS.3.7.a	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right.
	Rational Numbers in the Coordinate Plane I	MAFS.6.NS.3.6.c	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

Unit	Lesson Name	Standard Code	Standard Description
The Number System (continued)	Rational Numbers in the Coordinate Plane II	MAFS.6.NS.3.6.b	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
		MAFS.6.NS.3.8	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. 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.
		MAFS.6.RP.1.3.a	Ratios and Proportional Relationships. Understand ratio concepts and use ratio reasoning to solve problems. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
	Absolute Value I	MAFS.6.NS.3.7.c	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand ordering and absolute value of rational numbers. c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars.
	Absolute Value II	MAFS.6.NS.3.7.d	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand ordering and absolute value of rational numbers. d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.
Geometry	Distance on the Coordinate Plane I	MAFS.6.G.1.3	Geometry. Solve real-world and mathematical problems involving area, surface area, and volume. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
The Number System	Distance on the Coordinate Plane II	MAFS.6.NS.3.8	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. 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.

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Unit	Lesson Name	Standard Code	Standard Description
Expressions and Equations	Evaluating Simple Expressions	MAFS.5.OA.1.1	Operations and Algebraic Thinking. Write and interpret numerical expressions. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
		MAFS.6.EE.1.2.c	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Write, read, and evaluate expressions in which letters stand for numbers. c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length s = 1/2.
	Reasoning About One-Step Equations	MAFS.6.EE.2.5	Expressions and Equations. Reason about and solve one-variable equations and inequalities. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
	Writing and Solving One-Step Equations	MAFS.6.EE.2.7	Expressions and Equations. Reason about and solve one-variable equations and inequalities. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all non-negative rational numbers.
	Evaluating Expressions with Two Operations	MAFS.6.EE.1.2.c	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Write, read, and evaluate expressions in which letters stand for numbers. c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length s = 1/2.
	Evaluating Expressions with Real Numbers	MAFS.6.EE.1.2.b	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Write, read, and evaluate expressions in which letters stand for numbers. b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.
	Understanding Exponents	MAFS.6.EE.1.1	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Write and evaluate numerical expressions involving whole-number exponents.
	Evaluating Expressions and Equations with Exponents	MAFS.6.EE.1.1	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Write and evaluate numerical expressions involving whole-number exponents.
		MAFS.6.EE.1.2.c	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Write, read, and evaluate expressions in which letters stand for numbers. c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length s = 1/2.

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Imagine Math

Unit	Lesson Name	Standard Code	Standard Description
Expressions and Equations (continued)	Identifying and Generating Equivalent Expressions	MAFS.6.EE.1.3	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.
		MAFS.6.EE.1.4	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.
	Evaluating Expressions with the Distributive Property	MAFS.6.EE.1.3	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.
	Using the Distributive Property to Represent Real-World Situations	MAFS.6.EE.1.3	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.
Geometry	Area of Parallelograms	MAFS.6.G.1.1	Geometry. Solve real-world and mathematical problems involving area, surface area, and volume. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
	Area of Triangles	MAFS.6.G.1.1	Geometry. Solve real-world and mathematical problems involving area, surface area, and volume. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
	Area of Trapezoids and Composite Figures	MAFS.6.G.1.1	Geometry. Solve real-world and mathematical problems involving area, surface area, and volume. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
	Surface Area and Volume of Rectangular Prisms	MAFS.6.G.1.2	Geometry. Solve real-world and mathematical problems involving area, surface area, and volume. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\,w\,h$ and $V = b\,h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
		MAFS.6.G.1.4	Geometry. Solve real-world and mathematical problems involving area, surface area, and volume. Represent three-dimensional figures 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.

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Unit	Lesson Name	Standard Code	Standard Description
Geometry (continued)	Surface Area and Volume of Rectangular Prisms (continued)	MAFS.7.G.2.6	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
	Surface Area of Pyramids	MAFS.6.G.1.4	Geometry. Solve real-world and mathematical problems involving area, surface area, and volume. Represent three-dimensional figures 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.
		MAFS.7.G.2.6	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
Expressions and Equations	Independent and Dependent Quantities	MAFS.6.EE.3.9	Expressions and Equations. Represent and analyze quantitative relationships between dependent and independent variables. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.
Statistics and Probability	Measures of Spread - Range	MAFS.6.SP.1.2	Statistics and Probability. Develop understanding of statistical variability. 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.
		MAFS.6.SP.1.3	Statistics and Probability. Develop understanding of statistical variability. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
		MAFS.912.S-ID.1.3	Statistics and Probability: Interpreting Categorical and Quantitative Data. Summarize, represent, and interpret data on a single count or measurement variable. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
	Measures of Center - Median	MAFS.6.SP.1.2	Statistics and Probability. Develop understanding of statistical variability. 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.
		MAFS.6.SP.2.5.c	Statistics and Probability. Summarize and describe distributions. Summarize numerical data sets in relation to their context, such as by: c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
		MAFS.912.S-ID.1.3	Statistics and Probability: Interpreting Categorical and Quantitative Data. Summarize, represent, and interpret data on a single count or measurement variable. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

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Unit	Lesson Name	Standard Code	Standard Description
Statistics and Probability (continued)	Measures of Center - Mean	MAFS.6.SP.1.2	Statistics and Probability. Develop understanding of statistical variability. 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.
		MAFS.6.SP.2.5.c	Statistics and Probability. Summarize and describe distributions. Summarize numerical data sets in relation to their context, such as by: c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
		MAFS.912.S-ID.1.3	Statistics and Probability: Interpreting Categorical and Quantitative Data. Summarize, represent, and interpret data on a single count or measurement variable. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
	Understanding the Effects of Outliers on Mean and Median	MAFS.6.SP.1.3	Statistics and Probability. Develop understanding of statistical variability. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
	Deviation from the Mean	MAFS.6.SP.2.5.c	Statistics and Probability. Summarize and describe distributions. Summarize numerical data sets in relation to their context, such as by: c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
		MAFS.6.SP.2.5.d	Statistics and Probability. Summarize and describe distributions. Summarize numerical data sets in relation to their context, such as by: d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.
	Summarizing Data	MAFS.6.SP.1.2	Statistics and Probability. Develop understanding of statistical variability. 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.
		MAFS.6.SP.2.5.a	Statistics and Probability. Summarize and describe distributions. Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations.
		MAFS.6.SP.2.5.b	Statistics and Probability. Summarize and describe distributions. Summarize numerical data sets in relation to their context, such as by: b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
		MAFS.6.SP.2.5.c	Statistics and Probability. Summarize and describe distributions. Summarize numerical data sets in relation to their context, such as by: c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

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Unit	Lesson Name	Standard Code	Standard Description
Statistics and Probability (continued)	Summarizing Data (continued)	MAFS.6.SP.2.5.d	Statistics and Probability. Summarize and describe distributions. Summarize numerical data sets in relation to their context, such as by: d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.
	Data Analysis	MAFS.6.SP.1.1	Statistics and Probability. Develop understanding of statistical variability. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.
	Bar Graphs and Histograms	MAFS.6.SP.2.4	Statistics and Probability. Summarize and describe distributions. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
	Circle Graphs	MAFS.6.SP.2.4	Statistics and Probability. Summarize and describe distributions. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
	Stem-and-Leaf Plots	MAFS.6.SP.1.2	Statistics and Probability. Develop understanding of statistical variability. 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.
		MAFS.6.SP.1.3	Statistics and Probability. Develop understanding of statistical variability. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
		MAFS.6.SP.2.5.c	Statistics and Probability. Summarize and describe distributions. Summarize numerical data sets in relation to their context, such as by: c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
	Quartiles	MAFS.6.SP.1.2	Statistics and Probability. Develop understanding of statistical variability. 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.
		MAFS.6.SP.1.3	Statistics and Probability. Develop understanding of statistical variability. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
		MAFS.912.S-ID.1.2	Statistics and Probability: Interpreting Categorical and Quantitative Data. 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.

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Unit	Lesson Name	Standard Code	Standard Description
Statistics and Probability (continued)	Box Plots	MAFS.6.SP.1.2	Statistics and Probability. Develop understanding of statistical variability. 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.
		MAFS.6.SP.2.4	Statistics and Probability. Summarize and describe distributions. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
		MAFS.6.SP.2.5.c	Statistics and Probability. Summarize and describe distributions. Summarize numerical data sets in relation to their context, such as by: c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
		MAFS.912.S-ID.1.1	Statistics and Probability: Interpreting Categorical and Quantitative Data. Summarize, represent, and interpret data on a single count or measurement variable. Represent data with plots on the real number line (dot plots, histograms, and box plots).
		MAFS.912.S-ID.1.2	Statistics and Probability: Interpreting Categorical and Quantitative Data. 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.
		MAFS.912.S-ID.1.3	Statistics and Probability: Interpreting Categorical and Quantitative Data. Summarize, represent, and interpret data on a single count or measurement variable. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
Expressions and Equations	Introduction to the Language of Algebra	MAFS.6.EE.1.2.a	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as 5 - y.
		MAFS.6.EE.2.6	Expressions and Equations. Reason about and solve one-variable equations and inequalities. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
	Combining Like Terms	MAFS.6.EE.1.3	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.
		MAFS.6.EE.1.4	Expressions and Equations. Apply and extend previous understandings of arithmetic to algebraic expressions. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.

Unit	Lesson Name	Standard Code	Standard Description
Expressions and Equations (continued)	Introduction to Solving Word Problems with Algebra	MAFS.6.EE.2.7	Expressions and Equations. Reason about and solve one-variable equations and inequalities. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all non-negative rational numbers.
	Concept of In-equalities I	MAFS.6.EE.2.8	Expressions and Equations. Reason about and solve one-variable equations and inequalities. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Grade 7
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Unit	Lesson Name	Standard Code	Standard Description
Ratios and Proportional Relationships	Proportion Concepts	MAFS.7.RP.1.2.a	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
		MAFS.7.RP.1.2.c	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.
	Proportional Relationships in Tables and Equations	MAFS.7.RP.1.2.a	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
		MAFS.7.RP.1.2.c	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.
	Interpreting Unit Rates on Graphs	MAFS.7.RP.1.2.b	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
	Interpreting Points on Graphs of Proportional Relationships	MAFS.7.RP.1.1	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.
		MAFS.7.RP.1.2.d	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.
	Using Proportions to Solve Problems	MAFS.7.G.1.1	Geometry. Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
		MAFS.7.RP.1.3	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

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Unit	Lesson Name	Standard Code	Standard Description
Ratios and Proportional Relationships (continued)	Proportions in Scale Drawings	MAFS.7.G.1.1	Geometry. Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
		MAFS.7.RP.1.3	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
	Introduction to Similar Figures	MAFS.7.G.1.1	Geometry. Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
		MAFS.7.RP.1.2.c	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.
	Using Similar Figures to Solve Problems	MAFS.7.G.1.1	Geometry. Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
		MAFS.7.RP.1.2.c	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.
	Similarity	MAFS.7.G.1.1	Geometry. Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
Number and Operations- Fractions	Using Division to Write Fractions as Decimals	MAFS.7.NS.1.2.d	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

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Unit	Lesson Name	Standard Code	Standard Description
Expressions and Equations	Fraction, Decimal, and Percent Equivalents	MAFS.7.EE.2.3	Expressions and Equations. Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.
Ratios and Proportional Relationships	Percent and Percent Change	MAFS.7.RP.1.3	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
	Percent and Percent Error	MAFS.7.RP.1.3	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
	Simple Interest	MAFS.7.RP.1.3	Ratios and Proportional Relationships. Analyze proportional relationships and use them to solve real-world and mathematical problems. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

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Unit	Lesson Name	Standard Code	Standard Description
Expressions and Equations	Solving and Modeling Two-Step Problems	MAFS.7.EE.2.4.a	Expressions and Equations. Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
	Solving Equations with the Distributive Property	MAFS.7.EE.2.4.a	Expressions and Equations. Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
	Solving Equations with the Distributive Property in Context	MAFS.7.EE.2.4.a	Expressions and Equations. Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

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Unit	Lesson Name	Standard Code	Standard Description
The Number System	Adding and Subtracting Rational Numbers I	MAFS.7.NS.1.1.a	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.
		MAFS.7.NS.1.1.b	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. b. Understand $p + q$ as the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
		MAFS.7.NS.1.1.d	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. d. Apply properties of operations as strategies to add and subtract rational numbers.
	Adding and Subtracting Rational Numbers II	MAFS.7.NS.1.1.c	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
	Multiplying and Dividing Rational Numbers	MAFS.7.NS.1.2.a	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
		MAFS.7.NS.1.2.b	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.

Unit	Lesson Name	Standard Code	Standard Description
The Number System (continued)	Multiplying and Dividing Rational Numbers (continued)	MAFS.7.NS.1.2.c	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. c. Apply properties of operations as strategies to multiply and divide rational numbers.
		MAFS.7.NS.1.2.d	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
Number and Operations- Fractions	Understanding and Multiplying with Negative Mixed Numbers	MAFS.7.NS.1.2.c	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. c. Apply properties of operations as strategies to multiply and divide rational numbers.
The Number System	Writing and Interpreting Expressions with Rational Numbers	MAFS.7.EE.2.3	Expressions and Equations. Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.
		MAFS.7.NS.1.3	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Solve real-world and mathematical problems involving the four operations with rational numbers.
	Operations with Rational Numbers I	MAFS.7.NS.1.3	The Number System. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Solve real-world and mathematical problems involving the four operations with rational numbers.
	Operations with Rational Numbers II	MAFS.7.EE.2.3	Expressions and Equations. Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

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Unit	Lesson Name	Standard Code	Standard Description
Expressions and Equations	Solving Word Problems with Algebra	MAFS.7.EE.1.2	Expressions and Equations. Use properties of operations to generate equivalent expressions. Understand that re-writing an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."
	Common Factors in Polynomials	MAFS.7.EE.1.1	Expressions and Equations. Use properties of operations to generate equivalent expressions. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
		MAFS.912.A-SSE.1.2	Algebra: Seeing Structure in Expressions. Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
	Concept of Inequalities II	MAFS.7.EE.2.4.b	Expressions and Equations. Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.
Geometry	Circumference	MAFS.7.G.2.4	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
	Area of Circles	MAFS.7.G.2.4	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
	Area of Complex Composite Figures	MAFS.3.MD.3.7.d	Measurement and Data. Geometric measurement: understand concepts of area and relate area to multiplication and to addition. Relate area to the operations of multiplication and addition. d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.
		MAFS.6.G.1.1	Geometry. Solve real-world and mathematical problems involving area, surface area, and volume. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
		MAFS.7.G.2.6	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

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Unit	Lesson Name	Standard Code	Standard Description
Geometry (continued)	Surface Area and Volume of Rectangular Prisms	MAFS.6.G.1.2	Geometry. Solve real-world and mathematical problems involving area, surface area, and volume. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.
		MAFS.6.G.1.4	Geometry. Solve real-world and mathematical problems involving area, surface area, and volume. Represent three-dimensional figures 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.
		MAFS.7.G.2.6	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
	Surface Area of Cylinders	MAFS.7.G.2.4	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
		MAFS.7.G.2.6	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
	Surface Area of Pyramids	MAFS.6.G.1.4	Geometry. Solve real-world and mathematical problems involving area, surface area, and volume. Represent three-dimensional figures 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.
		MAFS.7.G.2.6	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
	Surface Area of Cones	MAFS.7.G.2.4	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
		MAFS.7.G.2.6	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
	Surface Area of Composite Solids	MAFS.7.G.2.4	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
		MAFS.7.G.2.6	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

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Unit	Lesson Name	Standard Code	Standard Description
Geometry (continued)	Angle Pairs	MAFS.7.G.2.5	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
	Angles in a Polygon	MAFS.7.G.2.5	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
		MAFS.8.G.1.5	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.
	Using Line Segments and Angles to Make Triangles	MAFS.7.G.1.2	Geometry. Draw, construct, and describe geometrical figures and describe the relationships between them. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
Statistics and Probability	Sampling	MAFS.7.SP.1.2	Statistics and Probability. Use random sampling to draw inferences about a population. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.
		MAFS.7.SP.2.4	Statistics and Probability. Draw informal comparative inferences about two populations. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.
		MAFS.912.S-ID.1.2	Statistics and Probability: Interpreting Categorical and Quantitative Data. 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.
	Comparing Data	MAFS.7.SP.2.3	Statistics and Probability. Draw informal comparative inferences about two populations. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.

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Unit	Lesson Name	Standard Code	Standard Description
Statistics and Probability (continued)	Simple Probability	MAFS.7.SP.3.5	Statistics and Probability. Investigate chance processes and develop, use, and evaluate probability models. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
		MAFS.7.SP.3.7.b	Statistics and Probability. Investigate chance processes and develop, use, and evaluate probability models. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?
	Compound Probability	MAFS.7.SP.3.5	Statistics and Probability. Investigate chance processes and develop, use, and evaluate probability models. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
		MAFS.7.SP.3.7.a	Statistics and Probability. Investigate chance processes and develop, use, and evaluate probability models. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.
		MAFS.7.SP.3.8.a	Statistics and Probability. Investigate chance processes and develop, use, and evaluate probability models. Find 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.
		MAFS.7.SP.3.8.b	Statistics and Probability. Investigate chance processes and develop, use, and evaluate probability models. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.
	Simulations of Simple and Compound Events	MAFS.7.SP.3.8.c	Statistics and Probability. Investigate chance processes and develop, use, and evaluate probability models. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?
	Making Predictions	MAFS.7.SP.3.6	Statistics and Probability. Investigate chance processes and develop, use, and evaluate probability models. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.

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Unit	Lesson Name	Standard Code	Standard Description
Expressions and Equations	Solving Two-Step Equations	MAFS.8.EE.3.7.b	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Solve linear equations in one variable. b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
	Solving Equations with the Variable on Both Sides	MAFS.8.EE.3.7.b	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Solve linear equations in one variable. b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
	Analyzing Solution Sets to Linear Equations with the Variable on Both Sides	MAFS.8.EE.3.7.a	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
	Interpreting Slope	MAFS.8.EE.2.5	Expressions and Equations. Understand the connections between proportional relationships, lines, and linear equations. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
	Slope	MAFS.8.EE.2.6	Expressions and Equations. Understand the connections between proportional relationships, lines, and linear equations. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
		MAFS.8.F.1.1	Functions. Define, evaluate, and compare functions. Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
		MAFS.8.F.1.2	Functions. Define, evaluate, and compare functions. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

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Unit	Lesson Name	Standard Code	Standard Description
Functions	Slope-Intercept Form	MAFS.8.EE.2.6	Expressions and Equations. Understand the connections between proportional relationships, lines, and linear equations. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
		MAFS.8.F.2.4	Functions. Use functions to model relationships between quantities. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
		MAFS.8.SP.1.3	Statistics and Probability. Investigate patterns of association in bivariate data. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.
	Point-Slope Form	MAFS.8.F.1.3	Functions. Define, evaluate, and compare functions. Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
		MAFS.8.F.2.4	Functions. Use functions to model relationships between quantities. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
Building Functions	Direct Variation	MAFS.8.SP.1.2	Statistics and Probability. Investigate patterns of association in bivariate data. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
		MAFS.8.SP.1.3	Statistics and Probability. Investigate patterns of association in bivariate data. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

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Unit	Lesson Name	Standard Code	Standard Description
Statistics and Probability	Comparing Linear and Nonlinear Data	MAFS.8.SP.1.1	Statistics and Probability. Investigate patterns of association in bivariate data. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
		MAFS.8.SP.1.2	Statistics and Probability. Investigate patterns of association in bivariate data. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
Expressions and Equations	Solving a System of Linear Equations Graphically	MAFS.8.EE.3.8.a	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
	Solving a System of Linear Equations Algebraically	MAFS.8.EE.3.8.b	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Analyze and solve pairs of simultaneous linear equations. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.
	Solving a System of Linear Equations - Applications	MAFS.8.EE.3.8.c	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Analyze and solve pairs of simultaneous linear equations. c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.
Functions	Interpreting Graphs of Real-World Situations	MAFS.8.F.2.5	Functions. Use functions to model relationships between quantities. Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
	Introduction to Sketching Graphs of Real-World Situations	MAFS.8.F.2.5	Functions. Use functions to model relationships between quantities. Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

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Unit	Lesson Name	Standard Code	Standard Description
Expressions and Equations	Understanding Properties of Integer Exponents	MAFS.8.EE.1.1	Expressions and Equations. Work with radicals and integer exponents. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$
	Applying Properties of Integer Exponents	MAFS.8.EE.1.1	Expressions and Equations. Work with radicals and integer exponents. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$
	Understanding Square and Cube Roots	MAFS.8.EE.1.2	Expressions and Equations. Work with radicals and integer exponents. 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. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
The Number System	Classifying and Ordering Real Numbers	MAFS.6.NS.3.7.a	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right.
		MAFS.6.NS.3.7.b	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand ordering and absolute value of rational numbers. b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write -3ºC > -7ºC to express the fact that -3ºC is warmer than -7ºC.
	Approximating Values of Irrational Numbers	MAFS.8.NS.1.1	The Number System. Know that there are numbers that are not rational, and approximate them by rational numbers. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
		MAFS.8.NS.1.2	The Number System. Know that there are numbers that are not rational, and approximate them by rational numbers. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
Expressions and Equations	Interpreting Numbers Written in Scientific Notation	MAFS.8.EE.1.3	Expressions and Equations. Work with radicals and integer exponents. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world is 7×10^9, and determine that the world populations is more than 20 times larger.
	Operations with Numbers in Scientific Notation	MAFS.8.EE.1.4	Expressions and Equations. Work with radicals and integer exponents. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Grade 8 Florida Learning Pathway

Imagine Math

Unit	Lesson Name	Standard Code	Standard Description
Geometry	Volume of Cylinders	MAFS.8.G.3.9	Geometry. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
		MAFS.912.G-GMD.1.3	Geometry: Geometric Measurement and Dimension. Explain volume formulas and use them to solve problems. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
	Volume of Pyramids and Cones	MAFS.8.G.3.9	Geometry. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
		MAFS.912.G-GMD.1.3	Geometry: Geometric Measurement and Dimension. Explain volume formulas and use them to solve problems. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
	Volume of Spheres	MAFS.8.G.3.9	Geometry. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
		MAFS.912.G-GMD.1.3	Geometry: Geometric Measurement and Dimension. Explain volume formulas and use them to solve problems. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
	Volume of Composite Solids	MAFS.8.G.3.9	Geometry. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
	Angles in a Polygon	MAFS.7.G.2.5	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
		MAFS.8.G.1.5	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.
	Parallel Lines and Transversals	MAFS.8.G.1.5	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.
	Understanding the Pythagorean Theorem	MAFS.8.G.2.6	Geometry. Understand and apply the Pythagorean Theorem. Explain a proof of the Pythagorean Theorem and its converse.
	Pythagorean Theorem - Hypotenuse	MAFS.8.G.2.7	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
		MAFS.912.G-SRT.3.8	Geometry: Similarity, Right Triangles, and Trigonometry. Define trigonometric ratios and solve problems involving right triangles. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

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Unit	Lesson Name	Standard Code	Standard Description
Geometry (continued)	Pythagorean Theorem - Legs	MAFS.8.G.2.7	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
		MAFS.912.G-SRT.3.8	Geometry: Similarity, Right Triangles, and Trigonometry. Define trigonometric ratios and solve problems involving right triangles. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
	Pythagorean Theorem - Mixed Problems	MAFS.8.G.2.7	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
	Pythagorean Theorem - Distance Formula	MAFS.8.G.2.7	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
		MAFS.8.G.2.8	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
	Translations	MAFS.8.G.1.2	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two congruent figures, describe a sequence that exhibits the congruence between them.
		MAFS.8.G.1.3	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
		MAFS.8.G.1.4	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
	Reflections	MAFS.8.G.1.2	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two congruent figures, describe a sequence that exhibits the congruence between them.
		MAFS.8.G.1.3	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
		MAFS.8.G.1.4	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

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Unit	Lesson Name	Standard Code	Standard Description
Geometry (continued)	Rotations	MAFS.8.G.1.2	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two congruent figures, describe a sequence that exhibits the congruence between them.
		MAFS.8.G.1.3	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
		MAFS.8.G.1.4	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
	Composition of Transformations	MAFS.8.G.1.2	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two congruent figures, describe a sequence that exhibits the congruence between them.
		MAFS.8.G.1.3	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
		MAFS.8.G.1.4	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
	Dilations	MAFS.8.G.1.3	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
		MAFS.8.G.1.4	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
	Congruence	MAFS.8.G.1.2	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two congruent figures, describe a sequence that exhibits the congruence between them.
Statistics and Probability	Patterns of Association in Data	MAFS.8.SP.1.4	Statistics and Probability. Investigate patterns of association in bivariate data. 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. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

Algebra Readiness
Florida Learning Pathway

Algebra Readiness Florida Learning Pathway

Unit	Lesson Name	Standard Code	Standard Description
Expressions and Equations	Solving Two-Step Equations	MAFS.8.EE.3.7.b	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Solve linear equations in one variable. b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
	Solving Equations with the Variable on Both Sides	MAFS.8.EE.3.7.b	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Solve linear equations in one variable. b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
	Analyzing Solution Sets to Linear Equations with the Variable on Both Sides	MAFS.8.EE.3.7.a	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
	Interpreting Slope	MAFS.8.EE.2.5	Expressions and Equations. Understand the connections between proportional relationships, lines, and linear equations. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
	Slope	MAFS.8.EE.2.6	Expressions and Equations. Understand the connections between proportional relationships, lines, and linear equations. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
		MAFS.8.F.1.1	Functions. Define, evaluate, and compare functions. Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
		MAFS.8.F.1.2	Functions. Define, evaluate, and compare functions. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

Algebra Readiness Florida Learning Pathway

Unit	Lesson Name	Standard Code	Standard Description
Functions	Slope-Intercept Form	MAFS.8.EE.2.6	Expressions and Equations. Understand the connections between proportional relationships, lines, and linear equations. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.
		MAFS.8.F.2.4	Functions. Use functions to model relationships between quantities. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
		MAFS.8.SP.1.3	Statistics and Probability. Investigate patterns of association in bivariate data. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.
	Point-Slope Form	MAFS.8.F.1.3	Functions. Define, evaluate, and compare functions. Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
		MAFS.8.F.2.4	Functions. Use functions to model relationships between quantities. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
Building Functions	Direct Variation	MAFS.8.SP.1.2	Statistics and Probability. Investigate patterns of association in bivariate data. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
		MAFS.8.SP.1.3	Statistics and Probability. Investigate patterns of association in bivariate data. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.
Statistics and Probability	Comparing Linear and Nonlinear Data	MAFS.8.SP.1.1	Statistics and Probability. Investigate patterns of association in bivariate data. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
		MAFS.8.SP.1.2	Statistics and Probability. Investigate patterns of association in bivariate data. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.

Algebra Readiness Florida Learning Pathway

Unit	Lesson Name	Standard Code	Standard Description
Expressions and Equations	Solving a System of Linear Equations Graphically	MAFS.8.EE.3.8.a	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
	Solving a System of Linear Equations Algebraically	MAFS.8.EE.3.8.b	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Analyze and solve pairs of simultaneous linear equations. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.
	Solving a System of Linear Equations - Applications	MAFS.8.EE.3.8.c	Expressions and Equations. Analyze and solve linear equations and pairs of simultaneous linear equations. Analyze and solve pairs of simultaneous linear equations. c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.
Functions	Interpreting Graphs of Real-World Situations	MAFS.8.F.2.5	Functions. Use functions to model relationships between quantities. Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
	Introduction to Sketching Graphs of Real-World Situations	MAFS.8.F.2.5	Functions. Use functions to model relationships between quantities. Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
Expressions and Equations	Understanding Properties of Integer Exponents	MAFS.8.EE.1.1	Expressions and Equations. Work with radicals and integer exponents. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, 3^2 x $3^{-5} = 3^{-3} = 1/3^3 = 1/27$
	Applying Properties of Integer Exponents	MAFS.8.EE.1.1	Expressions and Equations. Work with radicals and integer exponents. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, 3^2 x $3^{-5} = 3^{-3} = 1/3^3 = 1/27$
	Understanding Square and Cube Roots	MAFS.8.EE.1.2	Expressions and Equations. Work with radicals and integer exponents. 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. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

Algebra Readiness Florida Learning Pathway

Unit	Lesson Name	Standard Code	Standard Description
The Number System	Classifying and Ordering Real Numbers	MAFS.6.NS.3.7.a	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right.
		MAFS.6.NS.3.7.b	The Number System. Apply and extend previous understandings of numbers to the system of rational numbers. Understand ordering and absolute value of rational numbers. b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write -3ºC > -7ºC to express the fact that -3ºC is warmer than -7ºC.
	Approximating Values of Irrational Numbers	MAFS.8.NS.1.1	The Number System. Know that there are numbers that are not rational, and approximate them by rational numbers. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
		MAFS.8.NS.1.2	The Number System. Know that there are numbers that are not rational, and approximate them by rational numbers. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
Expressions and Equations	Interpreting Numbers Written in Scientific Notation	MAFS.8.EE.1.3	Expressions and Equations. Work with radicals and integer exponents. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8 and the population of the world is 7×10^9, and determine that the world populations is more than 20 times larger.
	Operations with Numbers in Scientific Notation	MAFS.8.EE.1.4	Expressions and Equations. Work with radicals and integer exponents. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Algebra Readiness Florida Learning Pathway

Unit	Lesson Name	Standard Code	Standard Description
Geometry	Volume of Cylinders	MAFS.8.G.3.9	Geometry. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
		MAFS.912.G-GMD.1.3	Geometry: Geometric Measurement and Dimension. Explain volume formulas and use them to solve problems. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
	Volume of Pyramids and Cones	MAFS.8.G.3.9	Geometry. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
		MAFS.912.G-GMD.1.3	Geometry: Geometric Measurement and Dimension. Explain volume formulas and use them to solve problems. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
	Volume of Spheres	MAFS.8.G.3.9	Geometry. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
		MAFS.912.G-GMD.1.3	Geometry: Geometric Measurement and Dimension. Explain volume formulas and use them to solve problems. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
	Volume of Composite Solids	MAFS.8.G.3.9	Geometry. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
	Angles in a Polygon	MAFS.7.G.2.5	Geometry. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
		MAFS.8.G.1.5	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.
	Parallel Lines and Transversals	MAFS.8.G.1.5	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.
	Understanding the Pythagorean Theorem	MAFS.8.G.2.6	Geometry. Understand and apply the Pythagorean Theorem. Explain a proof of the Pythagorean Theorem and its converse.
	Pythagorean Theorem - Hypotenuse	MAFS.8.G.2.7	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
		MAFS.912.G-SRT.3.8	Geometry: Similarity, Right Triangles, and Trigonometry. Define trigonometric ratios and solve problems involving right triangles. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.

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Unit	Lesson Name	Standard Code	Standard Description
Geometry (continued)	Pythagorean Theorem - Legs	MAFS.8.G.2.7	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
		MAFS.912.G-SRT.3.8	Geometry: Similarity, Right Triangles, and Trigonometry. Define trigonometric ratios and solve problems involving right triangles. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
	Pythagorean Theorem - Mixed Problems	MAFS.8.G.2.7	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
	Pythagorean Theorem - Distance Formula	MAFS.8.G.2.7	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
		MAFS.8.G.2.8	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
	Translations	MAFS.8.G.1.2	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two congruent figures, describe a sequence that exhibits the congruence between them.
		MAFS.8.G.1.3	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
		MAFS.8.G.1.4	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
	Reflections	MAFS.8.G.1.2	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two congruent figures, describe a sequence that exhibits the congruence between them.
		MAFS.8.G.1.3	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
		MAFS.8.G.1.4	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

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Unit	Lesson Name	Standard Code	Standard Description
Geometry (continued)	Rotations	MAFS.8.G.1.2	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two congruent figures, describe a sequence that exhibits the congruence between them.
		MAFS.8.G.1.3	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
		MAFS.8.G.1.4	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
	Composition of Transformations	MAFS.8.G.1.2	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two congruent figures, describe a sequence that exhibits the congruence between them.
		MAFS.8.G.1.3	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
		MAFS.8.G.1.4	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
	Dilations	MAFS.8.G.1.3	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
		MAFS.8.G.1.4	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
	Congruence	MAFS.8.G.1.2	Geometry. Understand congruence and similarity using physical models, transparencies, or geometry software. 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; given two congruent figures, describe a sequence that exhibits the congruence between them.
Statistics and Probability	Patterns of Association in Data	MAFS.8.SP.1.4	Statistics and Probability. Investigate patterns of association in bivariate data. 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. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

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Unit	Lesson Name	Standard Code	Standard Description
Expressions and Equations	Slope	MAFS.8.EE.2.6	Expressions and Equations. Understand the connections between proportional relationships, lines, and linear equations. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.
		MAFS.8.F.1.1	Functions. Define, evaluate, and compare functions. Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
		MAFS.8.F.1.2	Functions. Define, evaluate, and compare functions. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
Functions	Slope-Intercept Form	MAFS.8.EE.2.6	Expressions and Equations. Understand the connections between proportional relationships, lines, and linear equations. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.
		MAFS.8.F.2.4	Functions. Use functions to model relationships between quantities. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
		MAFS.8.SP.1.3	Statistics and Probability. Investigate patterns of association in bivariate data. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.
	Point-Slope Form	MAFS.8.F.1.3	Functions. Define, evaluate, and compare functions. Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s² giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
		MAFS.8.F.2.4	Functions. Use functions to model relationships between quantities. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

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Unit	Lesson Name	Standard Code	Standard Description
Creating Equations	Writing and Solving Linear Equations in One Variable	MAFS.912.A-CED.1.1	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions.
		MAFS.912.A-CED.1.3	Algebra: Creating Equations. Create equations that describe numbers or relationships. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
	Writing and Graphing Linear Equations in Two or More Variables	MAFS.912.A-CED.1.2	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
	Equations of Parallel and Perpendicular Lines	MAFS.912.A-CED.1.2	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
	Writing Linear Inequalities in One Variable	MAFS.912.A-CED.1.1	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions.
		MAFS.912.A-CED.1.3	Algebra: Creating Equations. Create equations that describe numbers or relationships. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
Reasoning with Equations and Inequalities	Solving Linear Inequalities in One Variable	MAFS.912.A-REI.2.3	Algebra: Reasoning with Equations and Inequalities. Solve equations and inequalities in one variable. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
	Solving Linear Equations in One Variable as a Reasoning Process	MAFS.912.A-REI.1.1	Algebra: Reasoning with Equations and Inequalities. Understand solving equations as a process of reasoning and explain the reasoning. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
		MAFS.912.A-REI.2.3	Algebra: Reasoning with Equations and Inequalities. Solve equations and inequalities in one variable. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
Creating Equations	Solving Literal Equations	MAFS.912.A-CED.1.4	Algebra: Creating Equations. Create equations that describe numbers or relationships. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.

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Unit	Lesson Name	Standard Code	Standard Description
Reasoning with Equations and Inequalities	Solving Systems of Linear Equations	MAFS.912.A-REI.3.5	Algebra: Reasoning with Equations and Inequalities. Solve systems of equations. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
		MAFS.912.A-REI.3.6	Algebra: Reasoning with Equations and Inequalities. Solve systems of equations. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
	Solving Linear Equations Graphically	MAFS.912.A-REI.4.10	Algebra: Reasoning with Equations and Inequalities. Represent and solve equations and inequalities graphically. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
		MAFS.912.A-REI.4.11	Algebra: Reasoning with Equations and Inequalities. Represent and solve equations and inequalities graphically. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
	Graphing Linear Inequalities and Systems of Linear Inequalities in Real-World Situations	MAFS.912.A-CED.1.3	Algebra: Creating Equations. Create equations that describe numbers or relationships. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
		MAFS.912.A-REI.4.12	Algebra: Reasoning with Equations and Inequalities. Represent and solve equations and inequalities graphically. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
Interpreting Functions	Function Notation I	MAFS.912.F-IF.1.1	Functions: Interpreting Functions. Understand the concept of a function and use function notation. Understand 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. 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 $y = f(x)$.
		MAFS.912.F-IF.1.2	Functions: Interpreting Functions. Understand the concept of a function and use function notation. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
	Function Notation II	MAFS.912.F-IF.1.1	Functions: Interpreting Functions. Understand the concept of a function and use function notation. Understand 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. 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 $y = f(x)$.
		MAFS.912.F-IF.1.2	Functions: Interpreting Functions. Understand the concept of a function and use function notation. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

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Unit	Lesson Name	Standard Code	Standard Description
Interpreting Functions (continued)	Understanding the Domain of a Function	MAFS.912.F-IF.2.5	Functions: Interpreting Functions. Interpret functions that arise in applications in terms of the context. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.
	Sketching Graphs of Linear Functions from Symbolic Representations	MAFS.912.F-IF.3.7.a	Functions: Interpreting Functions. Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima.
Arithmetic with Polynomials and Rational Expressions	Simplifying Monomials	MAFS.912.A-SSE.1.1.a	Algebra: Seeing Structure in Expressions. Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients.
	Adding and Subtracting Polynomials	MAFS.912.A-APR.1.1	Algebra: Arithmetic with Polynomials and Rational Expressions. Perform arithmetic operations on polynomials. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
	Multiplying Polynomials	MAFS.912.A-APR.1.1	Algebra: Arithmetic with Polynomials and Rational Expressions. Perform arithmetic operations on polynomials. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
Seeing Structure in Expressions	Factoring Polynomials	MAFS.912.A-SSE.1.2	Algebra: Seeing Structure in Expressions. Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
		MAFS.912.A-SSE.2.3.a	Algebra: Seeing Structure in Expressions. Write expressions in equivalent forms to solve problems. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines.
		MAFS.912.F-IF.3.8.a	Functions: Interpreting Functions. Analyze functions using different representations. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
Arithmetic with Polynomials and Rational Expressions	Multiplying and Dividing Monomials	MAFS.912.A-APR.1.1	Algebra: Arithmetic with Polynomials and Rational Expressions. Perform arithmetic operations on polynomials. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

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Unit	Lesson Name	Standard Code	Standard Description
Reasoning with Equations and Inequalities	Problem Solving with Quadratic Functions	MAFS.912.A-REI.2.4.b	Algebra: Reasoning with Equations and Inequalities. Solve equations and inequalities in one variable. Solve quadratic equations in one variable. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.
	Using the Quadratic Formula	MAFS.912.A-REI.2.4.b	Algebra: Reasoning with Equations and Inequalities. Solve equations and inequalities in one variable. Solve quadratic equations in one variable. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.

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Unit	Lesson Name	Standard Code	Standard Description
Quantities	Using Units to Solve Problems	MAFS.912.N-Q.1.1	Number and Quantity: Quantities. Reason quantitatively and use units to solve problems. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
		MAFS.912.N-Q.1.3	Number and Quantity: Quantities. Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
Linear, Quadratic, and Exponential Models	Introduction to Nonlinear Models	MAFS.912.F-LE.1.3	Functions: Linear, Quadratic, and Exponential Models. Construct and compare linear, quadratic, and exponential models and solve problems. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
Seeing Structure in Expressions	Interpreting the Structure of Linear and Exponential Expressions	MAFS.912.A-SSE.1.1.a	Algebra: Seeing Structure in Expressions. Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients.
		MAFS.912.A-SSE.1.1.b	Algebra: Seeing Structure in Expressions. Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.
Creating Equations	Writing and Solving Linear Equations in One Variable	MAFS.912.A-CED.1.1	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions.
		MAFS.912.A-CED.1.3	Algebra: Creating Equations. Create equations that describe numbers or relationships. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
	Writing and Graphing Linear Equations in Two or More Variables	MAFS.912.A-CED.1.2	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
	Equations of Parallel and Perpendicular Lines	MAFS.912.A-CED.1.2	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
	Writing Linear Inequalities in One Variable	MAFS.912.A-CED.1.1	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions.
		MAFS.912.A-CED.1.3	Algebra: Creating Equations. Create equations that describe numbers or relationships. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

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Unit	Lesson Name	Standard Code	Standard Description
Reasoning with Equations and Inequalities	Solving Linear Inequalities in One Variable	MAFS.912.A-REI.2.3	Algebra: Reasoning with Equations and Inequalities. Solve equations and inequalities in one variable. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
Creating Equations	Modeling Exponential Relationships with Equations, Inequalities, and Graphs	MAFS.912.A-CED.1.1	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions.
		MAFS.912.A-CED.1.2	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
Reasoning with Equations and Inequalities	Solving Linear Equations in One Variable as a Reasoning Process	MAFS.912.A-REI.1.1	Algebra: Reasoning with Equations and Inequalities. Understand solving equations as a process of reasoning and explain the reasoning. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
		MAFS.912.A-REI.2.3	Algebra: Reasoning with Equations and Inequalities. Solve equations and inequalities in one variable. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
Creating Equations	Solving Literal Equations	MAFS.912.A-CED.1.4	Algebra: Creating Equations. Create equations that describe numbers or relationships. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.
Reasoning with Equations and Inequalities	Solving Systems of Linear Equations	MAFS.912.A-REI.3.5	Algebra: Reasoning with Equations and Inequalities. Solve systems of equations. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
		MAFS.912.A-REI.3.6	Algebra: Reasoning with Equations and Inequalities. Solve systems of equations. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
	Solving Linear Equations Graphically	MAFS.912.A-REI.4.10	Algebra: Reasoning with Equations and Inequalities. Represent and solve equations and inequalities graphically. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
		MAFS.912.A-REI.4.11	Algebra: Reasoning with Equations and Inequalities. Represent and solve equations and inequalities graphically. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

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Unit	Lesson Name	Standard Code	Standard Description
Reasoning with Equations and Inequalities (continued)	Solving Exponential Equations Graphically	MAFS.912.A-REI.4.10	Algebra: Reasoning with Equations and Inequalities. Represent and solve equations and inequalities graphically. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
		MAFS.912.A-REI.4.11	Algebra: Reasoning with Equations and Inequalities. Represent and solve equations and inequalities graphically. Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
	Graphing Linear Inequalities and Systems of Linear Inequalities in Real-World Situations	MAFS.912.A-CED.1.3	Algebra: Creating Equations. Create equations that describe numbers or relationships. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
		MAFS.912.A-REI.4.12	Algebra: Reasoning with Equations and Inequalities. Represent and solve equations and inequalities graphically. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
Interpreting Functions	Function Notation I	MAFS.912.F-IF.1.1	Functions: Interpreting Functions. Understand the concept of a function and use function notation. Understand 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. 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).
		MAFS.912.F-IF.1.2	Functions: Interpreting Functions. Understand the concept of a function and use function notation. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
	Function Notation II	MAFS.912.F-IF.1.1	Functions: Interpreting Functions. Understand the concept of a function and use function notation. Understand 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. 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).
		MAFS.912.F-IF.1.2	Functions: Interpreting Functions. Understand the concept of a function and use function notation. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
	Interpreting Graphs of Linear and Exponential Functions in Context	MAFS.912.F-IF.2.4	Functions: Interpreting Functions. Interpret functions that arise in applications in terms of the context. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

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Unit	Lesson Name	Standard Code	Standard Description
Interpreting Functions (continued)	Sketching Graphs of Linear and Exponential Functions from a Context	MAFS.912.F-IF.2.4	Functions: Interpreting Functions. Interpret functions that arise in applications in terms of the context. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
	Understanding the Domain of a Function	MAFS.912.F-IF.2.5	Functions: Interpreting Functions. Interpret functions that arise in applications in terms of the context. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.
	Rate of Change for Linear and Exponential Functions	MAFS.912.F-IF.2.6	Functions: Interpreting Functions. Interpret functions that arise in applications in terms of the context. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
	Sketching Graphs of Linear Functions from Symbolic Representations	MAFS.912.F-IF-.3.7.a	Functions: Interpreting Functions. Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima.
	Sketching Graphs of Exponential Functions from Symbolic Representations	MAFS.912.F-IF-.3.7.e	Functions: Interpreting Functions. Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude, and using phase shift.
Building Functions	Transformations of Graphs of Linear and Exponential Functions	MAFS.912.F-BF.2.3	Functions: Building Functions. Build new functions from existing functions. Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
Interpreting Functions	Comparing Functions Using Different Representations	MAFS.912.F-IF.3.9	Functions: Interpreting Functions. Analyze functions using different representations. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.

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Unit	Lesson Name	Standard Code	Standard Description
Linear, Quadratic, and Exponential Models	Distinguishing Between Linear and Exponential Relationships	MAFS.912.F-LE.1.1	Functions: Linear, Quadratic, and Exponential Models. Construct and compare linear, quadratic, and exponential models and solve problems. Distinguish between situations that can be modeled with linear functions and with exponential functions.
		MAFS.912.F-LE.1.1.a	Functions: Linear, Quadratic, and Exponential Models. Construct and compare linear, quadratic, and exponential models and solve problems. Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
		MAFS.912.F-LE.1.1.b	Functions: Linear, Quadratic, and Exponential Models. Construct and compare linear, quadratic, and exponential models and solve problems. Distinguish between situations that can be modeled with linear functions and with exponential functions. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
		MAFS.912.F-LE.1.1.c	Functions: Linear, Quadratic, and Exponential Models. Construct and compare linear, quadratic, and exponential models and solve problems. Distinguish between situations that can be modeled with linear functions and with exponential functions. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
Building Functions	Writing Linear and Exponential Functions from a Context	MAFS.912.F-BF.1.1.a	Functions: Building Functions. Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
Linear, Quadratic, and Exponential Models	Writing Linear and Exponential Functions Based on Different Representations	MAFS.912.F-LE.1.2	Functions: Linear, Quadratic, and Exponential Models. Construct and compare linear, quadratic, and exponential models and solve problems. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

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Unit	Lesson Name	Standard Code	Standard Description
Building Functions	Composite Functions	MAFS.912.F-BF.1.1.b	Functions: Building Functions. Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.
	Writing Geometric Sequences Using an Explicit Formula	MAFS.912.F-BF.1.2	Functions: Building Functions. Build a function that models a relationship between two quantities. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
	Writing Geometric Sequences Recursively	MAFS.912.F-BF.1.2	Functions: Building Functions. Build a function that models a relationship between two quantities. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
	Writing Arithmetic Sequences Explicitly and Recursively	MAFS.912.F-BF.1.2	Functions: Building Functions. Build a function that models a relationship between two quantities. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
Interpreting Functions	Sequences as Functions	MAFS.912.F-IF.1.3	Functions: Interpreting Functions. Understand the concept of a function and use function notation. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.

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Unit	Lesson Name	Standard Code	Standard Description
Interpreting Categorical and Quantitative Data	Data Displays on the Real Number Line	MAFS.912.S-ID.1.1	Statistics and Probability: Interpreting Categorical and Quantitative Data. Summarize, represent, and interpret data on a single count or measurement variable. Represent data with plots on the real number line (dot plots, histograms, and box plots).
	Comparing the Shape, Center, and Spread of Data Sets	MAFS.912.S-ID.1.2	Statistics and Probability: Interpreting Categorical and Quantitative Data. 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.
		MAFS.912.S-ID.1.3	Statistics and Probability: Interpreting Categorical and Quantitative Data. Summarize, represent, and interpret data on a single count or measurement variable. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
	Summarizing and Interpreting Categorical Data	MAFS.912.S-ID.2.5	Statistics and Probability: Interpreting Categorical and Quantitative Data. Summarize, represent, and interpret data on two categorical and quantitative variables. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
	Fitting Functions to Data	MAFS.912.S-ID.2.6.a	Statistics and Probability: Interpreting Categorical and Quantitative Data. 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 function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, and exponential models.
		MAFS.912.S-ID.2.6.c	Statistics and Probability: Interpreting Categorical and Quantitative Data. 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 linear function for a scatter plot that suggests a linear association.
	Correlation	MAFS.912.S-ID.3.9	Statistics and Probability: Interpreting Categorical and Quantitative Data. Interpret linear models. Distinguish between correlation and causation.
Arithmetic with Polynomials and Rational Expressions	Adding and Subtracting Polynomials	MAFS.912.A-APR.1.1	Algebra: Arithmetic with Polynomials and Rational Expressions. Perform arithmetic operations on polynomials. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
	Multiplying Polynomials	MAFS.912.A-APR.1.1	Algebra: Arithmetic with Polynomials and Rational Expressions. Perform arithmetic operations on polynomials. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

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Unit	Lesson Name	Standard Code	Standard Description
The Real Number System	Products and Sums with Rational and Irrational Numbers	MAFS.912.N-RN.2.3	Number and Quantity: The Real Number System. Use properties of rational and irrational numbers. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.
	Using Rational Exponents to Rewrite Expressions	MAFS.912.N-RN.1.1	Number and Quantity: The Real Number System. Extend the properties of exponents to rational exponents. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3$ to hold, so $(5^{1/3})^3$ must equal 5.
		MAFS.912.N-RN.1.2	Number and Quantity: The Real Number System. Extend the properties of exponents to rational exponents. Rewrite expressions involving radicals and rational exponents using the properties of exponents.
Interpreting Functions	Rewriting and Interpreting Exponential Functions in Terms of Context	MAFS.912.A-SSE.2.3.c	Algebra: Seeing Structure in Expressions. Write expressions in equivalent forms to solve problems. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t} = 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%
		MAFS.912.F-IF.3.8.b	Functions: Interpreting Functions. Analyze functions using different representations. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. b. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay.
		MAFS.912.F-LE.2.5	Functions: Linear, Quadratic, and Exponential Models. Interpret expressions for functions in terms of the situation they model. Interpret the parameters in a linear or exponential function in terms of a context.
Seeing Structure in Expressions	Interpreting the Structure of Quadratic Expressions and Expressions with Rational Exponents	MAFS.912.A-SSE.1.1.a	Algebra: Seeing Structure in Expressions. Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients.
		MAFS.912.A-SSE.1.1.b	Algebra: Seeing Structure in Expressions. Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.

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Unit	Lesson Name	Standard Code	Standard Description
Creating Equations	Modeling Quadratic Relationships with Equations, Inequalities, and Graphs	MAFS.912.A-CED.1.1	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions.
		MAFS.912.A-CED.1.2	Algebra: Creating Equations. Create equations that describe numbers or relationships. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
		MAFS.912.A-CED.1.4	Algebra: Creating Equations. Create equations that describe numbers or relationships. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.
Building Functions	Writing Quadratic Functions from a Context	MAFS.912.F-BF.1.1.a	Functions: Building Functions. Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
		MAFS.912.F-BF.1.1.b	Functions: Building Functions. Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.
Seeing Structure in Expressions	Factoring Quadratic Expressions	MAFS.912.A-SSE.1.2	Algebra: Seeing Structure in Expressions. Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
		MAFS.912.A-SSE.2.3.a	Algebra: Seeing Structure in Expressions. Write expressions in equivalent forms to solve problems. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines.

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Unit	Lesson Name	Standard Code	Standard Description
Interpreting Functions	Sketching Graphs of Quadratic Functions in Context	MAFS.912.F-IF.2.4	Functions: Interpreting Functions. Interpret functions that arise in applications in terms of the context. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
		MAFS.912.F-IF.2.5	Functions: Interpreting Functions. Interpret functions that arise in applications in terms of the context. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.
		MAFS.912.F-IF.2.6	Functions: Interpreting Functions. Interpret functions that arise in applications in terms of the context. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
	Sketching and Transforming Graphs of Quadratic Functions from Symbolic Representations	MAFS.912.F-BF.2.3	Functions: Building Functions. Build new functions from existing functions. Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
		MAFS.912.F-IF.3.7.a	Functions: Interpreting Functions. Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima.
Reasoning with Equations and Inequalities	Solving Quadratics - Completing the Square	MAFS.912.A-REI.2.4.a	Algebra: Reasoning with Equations and Inequalities. Solve equations and inequalities in one variable. Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.
Building Functions	Writing Quadratic Functions From Their Graphs	MAFS.912.A-REI.4.10	Algebra: Reasoning with Equations and Inequalities. Represent and solve equations and inequalities graphically. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
		MAFS.912.F-BF.1.1	Functions: Building Functions. Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities.
		MAFS.912.F-IF.3.8	Functions: Interpreting Functions. Analyze functions using different representations. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

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Unit	Lesson Name	Standard Code	Standard Description
Interpreting Functions	Rewriting Quadratics to Reveal Their Structure	MAFS.912.A-SSE.2.3.b	Algebra: Seeing Structure in Expressions. Write expressions in equivalent forms to solve problems. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
		MAFS.912.F-IF.3.8.a	Functions: Interpreting Functions. Analyze functions using different representations. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
Reasoning with Equations and Inequalities	Problem Solving with Quadratic Functions	MAFS.912.A-REI.2.4.b	Algebra: Reasoning with Equations and Inequalities. Solve equations and inequalities in one variable. Solve quadratic equations in one variable. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.
	Using the Quadratic Formula	MAFS.912.A-REI.2.4.b	Algebra: Reasoning with Equations and Inequalities. Solve equations and inequalities in one variable. Solve quadratic equations in one variable. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.
	Solving a System of Linear and Quadratic Equations	MAFS.912.A-REI.3.7	Algebra: Reasoning with Equations and Inequalities. Solve systems of equations. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.
Interpreting Functions	Piecewise, Step, and Absolute Value Functions	MAFS.912.F-IF.3.7.b	Functions: Interpreting Functions. Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
Building Functions	Writing Inverse Functions	MAFS.912.F-BF.2.4.a	Functions: Building Functions. Build new functions from existing functions. Find inverse functions. a. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x^3 or f(x) = (x+1)/(x-1) for x ≠ 1.

Geometry
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Unit	Lesson Name	Standard Code	Standard Description
Congruence	Defining Basic Geometric Elements	MAFS.912.G-CO.1.1	Geometry: Congruence. Experiment with transformations in the plane. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
	Defining Transformations	MAFS.912.G-CO.1.4	Geometry: Congruence. Experiment with transformations in the plane. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
	Rotational and Reflectional Symmetry	MAFS.912.G-CO.1.3	Geometry: Congruence. Experiment with transformations in the plane. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
	Representing Transformations with Algebra	MAFS.912.G-CO.1.2	Geometry: Congruence. Experiment with transformations in the plane. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
	Rigid Motion and Congruence	MAFS.912.G-CO.1.5	Geometry: Congruence. Experiment with transformations in the plane. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
		MAFS.912.G-CO.2.6	Geometry: Congruence. Understand congruence in terms of rigid motions. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.
	What Is Proof?	MAFS.912.G-CO.2.7	Geometry: Congruence. Understand congruence in terms of rigid motions. Use the definition of congruence in terms 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.
		MAFS.912.G-CO.3.9	Geometry: Congruence. Prove geometric theorems. Prove theorems about lines and angles; use theorems about lines and angles to solve problems. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
	Proving Theorems About Lines and Angles	MAFS.912.G-CO.3.9	Geometry: Congruence. Prove geometric theorems. Prove theorems about lines and angles; use theorems about lines and angles to solve problems. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
	Proving Theorems About Congruent Triangles	MAFS.912.G-CO.2.8	Geometry: Congruence. Understand congruence in terms of rigid motions. Explain how the criteria for triangle congruence (ASA, SAS, SSS, and Hypotenuse-Leg) follow from the definition of congruence in terms of rigid motions.
		MAFS.912.G-CO.3.10	Geometry: Congruence. Prove geometric theorems. Prove theorems about triangles; use theorems about triangles to solve problems. Theorems include: measures of interior angles of a triangle sum to 180°; triangle inequality theorem; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.

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Imagine Math

Unit	Lesson Name	Standard Code	Standard Description
Similarity, Right Triangles, and Trigonometry	Problem Solving with Congruent Triangles	MAFS.912.G-CO.3.10	Geometry: Congruence. Prove geometric theorems. Prove theorems about triangles; use theorems about triangles to solve problems. Theorems include: measures of interior angles of a triangle sum to 180°; triangle inequality theorem; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
		MAFS.912.G-SRT.2.5	Geometry: Similarity, Right Triangles, and Trigonometry. Prove theorems involving similarity. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
Congruence	Proving Theorems About Relationships in Triangles	MAFS.912.G-CO.3.10	Geometry: Congruence. Prove geometric theorems. Prove theorems about triangles; use theorems about triangles to solve problems. Theorems include: measures of interior angles of a triangle sum to 180°; triangle inequality theorem; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
	Proving Theorems About Parallelograms	MAFS.912.G-CO.3.11	Geometry: Congruence. Prove geometric theorems. Prove theorems about parallelograms; use theorems about parallelograms to solve problems. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.
	Constructing Angles and Special Line Segments	MAFS.912.G-CO.4.12	Geometry: Congruence. Make geometric constructions. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.
	Constructing Inscribed Figures	MAFS.912.G-CO.4.13	Geometry: Congruence. Make geometric constructions. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.
Modeling with Geometry	Modeling Objects with Geometric Figures	MAFS.912.G-MG.1.1	Geometry: Modeling with Geometry. Apply geometric concepts in modeling situations. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
	Using Geometric Relationships to Solve Design Problems	MAFS.912.G-MG.1.3	Geometry: Modeling with Geometry. Apply geometric concepts in modeling situations. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

Geometry Florida Learning Pathway

Unit	Lesson Name	Standard Code	Standard Description
Similarity, Right Triangles, and Trigonometry	Properties of Dilations I	MAFS.912.G-SRT.1.1.b	Geometry: Similarity, Right Triangles, and Trigonometry. Understand similarity in terms of similarity transformations. Verify experimentally the properties of dilations given by a center and a scale factor: b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
	Properties of Dilations II	MAFS.912.G-SRT.1.1.a	Geometry: Similarity, Right Triangles, and Trigonometry. Understand similarity in terms of similarity transformations. Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
	Transformations and Similarity	MAFS.912.G-SRT.1.2	Geometry: Similarity, Right Triangles, and Trigonometry. Understand similarity in terms of similarity transformations. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
	Transformations and Similarity	MAFS.912.G-SRT.1.3	Geometry: Similarity, Right Triangles, and Trigonometry. Understand similarity in terms of similarity transformations. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
	Problem Solving with Transformations and Similarity	MAFS.912.G-SRT.2.5	Geometry: Similarity, Right Triangles, and Trigonometry. Prove theorems involving similarity. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
Geometry	Pythagorean Theorem - Hypotenuse	MAFS.8.G.2.7	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
		MAFS.912.G-SRT.3.8	Geometry: Similarity, Right Triangles, and Trigonometry. Define trigonometric ratios and solve problems involving right triangles. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
	Pythagorean Theorem - Legs	MAFS.8.G.2.7	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
		MAFS.912.G-SRT.3.8	Geometry: Similarity, Right Triangles, and Trigonometry. Define trigonometric ratios and solve problems involving right triangles. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
	Pythagorean Theorem - Mixed Problems	MAFS.8.G.2.7	Geometry. Understand and apply the Pythagorean Theorem. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

Geometry Florida Learning Pathway

Unit	Lesson Name	Standard Code	Standard Description
Similarity, Right Triangles, and Trigonometry	Proving Theorems About Similar Triangles	MAFS.912.G-SRT.2.4	Geometry: Similarity, Right Triangles, and Trigonometry. Prove theorems involving similarity. Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.
	Similarity and Trigonometric Ratios	MAFS.912.G-SRT.3.6	Geometry: Similarity, Right Triangles, and Trigonometry. Define trigonometric ratios and solve problems involving right triangles. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
	Problem Solving with Similarity and Trigonometric Ratios	MAFS.912.G-SRT.3.8	Geometry: Similarity, Right Triangles, and Trigonometry. Define trigonometric ratios and solve problems involving right triangles. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
	Sine and Cosine of Complementary Angles	MAFS.912.G-SRT.3.7	Geometry: Similarity, Right Triangles, and Trigonometry. Define trigonometric ratios and solve problems involving right triangles. Explain and use the relationship between the sine and cosine of complementary angles.
Geometry	Volume of Cylinders	MAFS.8.G.3.9	Geometry. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
		MAFS.912.G-GMD.1.3	Geometry: Geometric Measurement and Dimension. Explain volume formulas and use them to solve problems. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
	Volume of Pyramids and Cones	MAFS.8.G.3.9	Geometry. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
		MAFS.912.G-GMD.1.3	Geometry: Geometric Measurement and Dimension. Explain volume formulas and use them to solve problems. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
	Volume of Spheres	MAFS.8.G.3.9	Geometry. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
		MAFS.912.G-GMD.1.3	Geometry: Geometric Measurement and Dimension. Explain volume formulas and use them to solve problems. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
Modeling with Geometry	Rates with Area and Volume	MAFS.912.G-MG.1.2	Geometry: Modeling with Geometry. Apply geometric concepts in modeling situations. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).
Geometric Measurement and Dimension	Understanding Formulas for Curved Figures	MAFS.912.G-GMD.1.1	Geometry: Geometric Measurement and Dimension. Explain volume formulas and use them to solve problems. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.
	Cross Sections of 3-Dimensional Figures	MAFS.912.G-GMD.2.4	Geometry: Geometric Measurement and Dimension. Visualize relationships between two-dimensional and three-dimensional objects. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.

Geometry Florida Learning Pathway

Unit	Lesson Name	Standard Code	Standard Description
Expressing Geometric Properties with Equations	Coordinates of Parallel and Perpendicular Lines	MAFS.912.G-GPE.2.4	Geometry: Expressing Geometric Properties with Equations. Use coordinates to prove simple geometric theorems algebraically. Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.
		MAFS.912.G-GPE.2.5	Geometry: Expressing Geometric Properties with Equations. Use coordinates to prove simple geometric theorems algebraically. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
	Problem Solving with Coordinates of Parallel and Perpendicular Lines	MAFS.912.G-GPE.2.4	Geometry: Expressing Geometric Properties with Equations. Use coordinates to prove simple geometric theorems algebraically. Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.
	Dividing a Segment Proportionally	MAFS.912.G-GPE.2.6	Geometry: Expressing Geometric Properties with Equations. Use coordinates to prove simple geometric theorems algebraically. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.
	Using Coordinates to Find Perimeters and Areas	MAFS.912.G-GPE.2.7	Geometry: Expressing Geometric Properties with Equations. Use coordinates to prove simple geometric theorems algebraically. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.
Circles	Tangents, Chords, Radii, and Angles in Circles	MAFS.912.G-C.1.2	Geometry: Circles. Understand and apply theorems about circles. Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.
		MAFS.912.G-C.1.4	Geometry: Circles. Understand and apply theorems about circles. Construct a tangent line from a point outside a given circle to the circle.
	Radians and Area of Sectors	MAFS.912.G-C.2.5	Geometry: Circles. Find arc lengths and areas of sectors of circles. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.

Geometry Florida Learning Pathway

Unit	Lesson Name	Standard Code	Standard Description
Expressing Geometric Properties with Equations	Equation of a Circle	MAFS.912.G-C.1.1	Geometry: Circles. Understand and apply theorems about circles. Prove that all circles are similar.
		MAFS.912.G-GPE.1.1	Geometry: Expressing Geometric Properties with Equations. Translate between the geometric description and the equation for a conic section. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
	Problem Solving with the Equation of a Circle	MAFS.912.G-GPE.1.1	Geometry: Expressing Geometric Properties with Equations. Translate between the geometric description and the equation for a conic section. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
		MAFS.912.G-GPE.2.4	Geometry: Expressing Geometric Properties with Equations. Use coordinates to prove simple geometric theorems algebraically. Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.
	Deriving the Equation of a Parabola from Its Definition	MAFS.912.G-GPE.1.2	Geometry: Expressing Geometric Properties with Equations. Translate between the geometric description and the equation for a conic section. Derive the equation of a parabola given a focus and directrix.
Circles	Quadrilaterals Inscribed in Circles	MAFS.912.G-C.1.3	Geometry: Circles. Understand and apply theorems about circles. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.
Similarity, Right Triangles, and Trigonometry	Law of Sines and Law of Cosines	MAFS.912.G-SRT.4.11	Geometry: Similarity, Right Triangles, and Trigonometry. Apply trigonometry to general triangles. Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).
Conditional Probability and the Rules of Probability	Organizing Possible Outcomes of Events	MAFS.912.S-CP.1.1	Statistics and Probability: Conditional Probability and the Rules of Probability. Understand independence and conditional probability and use them to interpret data. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").
	Using Area Models for Compound Probability	MAFS.912.S-CP.1.5	Statistics and Probability: Conditional Probability and the Rules of Probability. 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. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.
		MAFS.912.S-CP.2.9	Statistics and Probability: Conditional Probability and the Rules of Probability. Use the rules of probability to compute probabilities of compound events in a uniform probability model. Use permutations and combinations to compute probabilities of compound events and solve problems.
	Understanding Independent and Dependent Events	MAFS.912.S-CP.1.2	Statistics and Probability: Conditional Probability and the Rules of Probability. Understand independence and conditional probability and use them to interpret data. Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

Geometry Florida Learning Pathway

Unit	Lesson Name	Standard Code	Standard Description
Conditional Probability and the Rules of Probability (continued)	Understanding Conditional Probability	MAFS.912.S-CP.1.3	Statistics and Probability: Conditional Probability and the Rules of Probability. Understand independence and conditional probability and use them to interpret data. Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.
		MAFS.912.S-CP.2.6	Statistics and Probability: Conditional Probability and the Rules of Probability. 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 terms of the model.
	Modeling Probability Situations Using Two-Way Frequency Tables	MAFS.912.S-CP.1.4	Statistics and Probability: Conditional Probability and the Rules of Probability. Understand independence and conditional probability and use them to interpret data. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.
		MAFS.912.S-CP.2.6	Statistics and Probability: Conditional Probability and the Rules of Probability. 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 terms of the model.
	Relating Probabilities of Unions and Intersections of Events	MAFS.912.S-CP.2.7	Statistics and Probability: Conditional Probability and the Rules of Probability. 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 terms of the model.

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