4th Grade Mathematics Scope & Sequence

Unit	Standard(s)/Outcome(s)/Topic(s)	Essential/Guiding Questions
Unit 1: Addition and Subtraction with Multi-Digit Numbers (Sept.)	**4.NBT.A.2:** 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. **4.NBT.A.3:** Use place value understanding to round multi-digit whole numbers to any place. **4.NBT.B.4:** Fluently add and subtract multi-digit whole numbers using the standard algorithm.	• How do we use place value understanding to compare large numbers? • How can patterns, strategies, and formulas help solve problems accurately? • When is estimation more useful than finding a precise answer? • Why is place value understanding important in addition and subtraction? • What is the relationship between addition and subtraction? • How can we use mathematical properties and/or rules to solve problems?

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Unit 2: Multiplication and Division (Sept.-Nov.)	**4.NBT.A.1:** 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 divided by 70 equals 10 by applying concepts of place value and division. **4.NBT.5:** 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. **4.NBT.6:** 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. **4.OA.3:** 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	• How does the value of a digit change when it is multiplied and divided by 10? • How can patterns, strategies, and formulas help solve problems accurately? • When is estimation more useful than finding a precise answer? • Why is place value understanding important in multiplication and division? • What is the relationship between multiplication and division? • How can we use mathematical properties and/or rules to solve problems? • What are factors? How are factors of a number determined?

	rounding. **4.OA.4:** Find all factor pairs for a whole number in the range 1-100. 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. Determine whether a given whole number in the range 1-100 is prime or composite. **4.OA.5:** 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. **4.MD.3:** 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.	• What does it mean for a number to be classified as either prime or composite? • How are remainders and divisors related? • What is the meaning of a remainder in a division problem? • How do compatible numbers aid in dividing whole numbers? • How can an understanding of representing multi-digit multiplication help in solving area problems?
Unit	**Standard(s)/Outcome(s)/Topic(s)**	**Essential/Guiding Questions**
Unit 3: Decomposing and Composing Fractions/ Fraction Equivalence and	**4.NF.1:** Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × 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.	• What is a fraction? • How does the size of the whole or set impact the relative value of the fraction named?

Comparison (Nov./Dec.)	**4.NF.2:** 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 ½. 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. **4.NF.3:** 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. 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.	• How can fractions be represented on a number line? • How are unit fractions used to compose other fractions? • Why is there no least or greatest fraction on the number line? • How can we use reasoning to compare fractions? • How can fractions with different-sized fractional parts describe the same-sized region? • How can whole numbers be expressed as fractions?
Unit	**Standard(s)/Outcome(s)/Topic(s)**	**Essential/Guiding Questions**
Unit 4: Addition/ Subtraction with Fractions and Decimal Fractions (Dec./Jan.)	**4.NF.1:** Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × 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. **4.NF.A.3:** c. Add and subtract mixed numbers with like	• How can we determine the operation(s) needed to solve multi-step word problems? • What strategy can I use to determine the reasonableness of my answer?

	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. 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 **4.NF.C.5:** 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 **4.NF.C.6:** 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. **4.NF.C.7:** 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. **4.MD.B.4:** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.	• How can we use math properties, patterns, and rules to solve problems? • How are unit fractions used to compose other fractions? • How can whole numbers be expressed as fractions? • How can we use measurement to solve problems? • How can we create line plots to represent data? • What is a decimal? • How are fractions and decimals related? • How can decimals be represented? • How can we use reasoning to compare decimals?

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Unit 5: Geometry and Patterns (Feb./Mar.)	**4.G.A.1:** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. **4.G.A.2:** 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. **4.G.A.3:** 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. **4.MD.C.5:** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. **4.MD.C.5.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. **4.MD.C.5.b:** An angle that turns through n one-degree angles is said to have an angle measure of	• How can two-dimensional figures be classified? • How can parallelism, perpendicularity, and angle measure be used to analyze quadrilaterals and triangles? • How are quadrilaterals similar and different? • How are triangles alike and different? • How do I know when a figure is symmetrical? • How do you measure an angle? • How do you construct an angle of a given measure? • How can an angle be divided?

	n degrees. **4.MD.C.6:** Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure. **4.MD.C.7:** 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. **4.OA.C.5:** 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.	
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Unit 6: Multiplicative Comparison and Measurement (Mar./Apr.)	**4.OA.A.1:** Interpret a multiplication equation as a comparison, e.g. interpret 35 = 5 x 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. **4.OA.A.2:** 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. **4.OA.3:** Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including	• How can quantities be compared multiplicatively? • How are units within a single system of measure related to one other? • How can multiplication help us to solve problems? • How can rounding help us compute problems? • What is a reasonable answer to a problem?

	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. **4.MD.A.1:** 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. **4.MD.A.2:** Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	• How can measurement relationships be used to solve problems?
Unit	**Standard(s)/Outcome(s)/Topic(s)**	**Essential/Guiding Questions**
Unit 7: Multiplying Fractions by Whole Numbers (May)	**4.OA.A.1:** Interpret a multiplication equation as a comparison, e.g. interpret 35 = 5 x 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. **4.NF.1:** Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction	• How is multiplying fractions similar to multiplying whole numbers? • How can multiplying a fraction by a whole number be

	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. **4.NF.B.4.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). **4.NF.B.4.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) **4.NF.B.4.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?	represented using area and measurement models, as well a number line? ● How can estimation of fractions be useful in determining the reasonableness of answers?
Unit	**Standard(s)/Outcome(s)/Topic(s)**	**Essential/Guiding Questions**
Unit 8: Measurement Problem Solving (May/June)	**4.MD.A.1:** 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.	● How can multiplication help us to solve problems? ● How can rounding help us compute problems? ● What is a reasonable

	4.MD.A.2: Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. **4.MD.A.3:** 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.	answer to a problem? ● How are units within a single system of measure related to one other? ● How can measurement relationships be used to solve problems?