West Contra Costa Unified School District

Grade 4 Mathematics Curriculum Guide

Grade Level/Course Title: Grade 4	Trimester 1	Academic Year: 2017-2018

Grade Level Mathematics Focus:
In Grade 4, instructional time should focus on three critical areas: (1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; (3) understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Essential Questions:
1. How can students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place?

Time Frame	Standard	Standard Description	Content	Resources
(Aug.-Sept.) **Chapter 1:** **Place Value** **(Approx.** **9 days)**	4.NBT.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 ÷ 70 = 10 by applying concepts of place value and division.*	• Decomposition by place value • Decomposition of whole numbers by addition • Using decomposition to add and subtract whole numbers • Using open number lines to represent multi-digit addition and subtraction • Using bar models to add and subtract multi-digit numbers • Inverse relationship between addition and subtraction • Commutative and associative properties of addition	**Chapter 1 – Place Value (6 Lessons)** 1-1: Place Value 1-2: Read and Write Multi-Digit Numbers 1-3: Compare Numbers 1-4: Order Numbers 1-5: Use Place Value to Round 1-6: Problem-Solving Investigation: Use the Four-Step Plan Plotting Numbers on a Number Line [L] Comparing Numbers on a Number Line [L] Searching for Tens [L] Rounding/Estimating [L] Comparing Expressions [L] Rolling Numbers [GMR] Addition/Subtraction Strategies K-7 Three Reads for Word Problems What's My Number [IMT] Ordering Four Digit Numbers [IMT] Rounding to the Nearest Hundred and Thousand [IMT] Rounding on the Number Line [IMT] Rounding to the Nearest Thousand [IMT] SBAC Sample Questions Claim 1D: Place Value
	4.NBT.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.3	Use place value understanding to round multi-digit whole numbers to any place.		
	4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm		

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Essential Questions:
1.   How can students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place?

Time Frame	Standard	Standard Description	Content	Resources
(Sept.) Chapter 2: Add and Subtract Whole Numbers (Approx. 12 days)	4.NBT.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 ÷ 70 = 10 by applying concepts of place value and division.*	• Decomposition by place value • Decomposition of whole numbers by addition • Using decomposition to add and subtract whole numbers • Using open number lines to represent multi-digit addition and subtraction • Using bar models to add and subtract multi-digit numbers • Inverse relationship between addition and subtraction • Commutative and associative properties of addition	**Chapter 2 – Add and Subtract Whole Numbers (9 Lessons)** 2-1: Addition Properties and Subtraction Rules 2-2: Addition and Subtraction Patterns 2-3: Add and Subtract Mentally 2-4: Estimate Sums and Differences 2-5: Add Whole Numbers 2-6: Subtract Whole Numbers 2-7: Subtract Across Zeros 2-8: Problem-Solving Investigation: Draw a Diagram 2-9: Solve Multi-Step Word Problems Adding and Subtracting Whole Numbers — Multiple Representations [CP] Adding Whole Numbers — Multiple Algorithms [L] Addition/Subtraction Strategies K-7 Subtracting Whole Numbers – Multiple Algorithms [L] Number Line Subtraction [L] To Regroup or Not to Regroup [IMT] SBAC Sample Questions Claim 1E: Properties and Operations Parent Guide (English): Adding Whole Numbers — Multiple Methods Parent Guide (Spanish): Sumando Números Parent Guide (English): Subtracting Numbers — Multiple Methods Parent Guide (Spanish): Restando Números
	4.NBT.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.3	Use place value understanding to round multi-digit whole numbers to any place.		
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Essential Questions:
1. How can students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends?
2. How can students select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context?

Time Frame	Standard	Standard Description	Content	Resources
(Oct.) **Chapter 3:** **Understand Multiplication and Division** **(Approx.** **11 days)** (Continues on next page)	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.	• Equal-sized groups • Repeated addition • Arrays • Area Models • Commutative Property • Associative Property • Importance of place value when multiplying • Partial Products • Distributive Property • Using open number lines to represent multiplication • Using bar models to represent multiplication • Using decomposition to multiply (any decomposition and by place value) • Multiple representations of Idivision	**Chapter 3 – Understand Multiplication and Division (8 Lessons)** 3-1: Relate Multiplication and Division 3-2: Relate Division as Subtraction 3-3: Multiplication as Comparison 3-4: Compare to Solve Problems 3-5: Multiplication Properties and Division Rules 3-6: The Associative Property of Multiplication 3-7: Factors and Multiples 3-8: Problem-Solving Investigation: Estimate Identifying Multiples [IMT] Multiples of 3, 6, and 7 [IMT] Numbers in a Multiplication Table [IMT] Division — Multiple Representations [CP] Division — Divvy Out Greater Numbers [L] Division Algorithms [L] Thousands and Millions of Fourth Graders [IMT] Mental Division Strategy [IMT]
	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.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.		

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Essential Questions:
1. How can students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends?
2. How can students select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context?

Time Frame	Standard	Standard Description	Content	Resources
(Oct.) **Chapter 3:** **(Continued)** **Understand Multiplication 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.	• Equal-sized groups • Repeated addition • Arrays • Area Models • Commutative Property • Associative Property • Importance of place value when multiplying • Partial Products • Distributive Property • Using open number lines to represent multiplication • Using bar models to represent multiplication • Using decomposition to multiply (any decomposition and by place value) • Multiple representations of division	**Chapter 3 – Understand Multiplication and Division (8 Lessons)** SBAC Sample Questions Claim 1B: Factors and Multiples Parent Guide (English): Multiplying Numbers – Multiple Methods Parent Guide (Spanish): Multiplicando Números Parent Guide (English): Dividing Numbers- Multiple Methods Parent Guide (Spanish): Dividiendo Números
	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.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.		

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Essential Questions:
1. How can students develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems?

Time Frame	Standard	Standard Description	Content	Resources
(Oct.) **Chapter 4:** **Multiply with One-Digit Numbers** **(Approx. 14 days)**	4.OA.1	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.	• Equal-sized groups • Repeated addition • Arrays • Area Models • Commutative Property • Associative Property • Importance of place value when multiplying • Partial Products • Distributive Property • Using open number lines to represent multiplication • Using bar models to represent multiplication • Using decomposition to multiply (any decomposition and by place value)	**Chapter 4 – Multiply with One-Digit Numbers (11 Lessons)** 4-1: Multiples of 10, 100, and 1,000 4-2: Round to Estimate Products 4-3: Hands On: Use Place Value to Multiply 4-4: Hands On: Use Models to Multiply 4-5: Multiply by a Two-Digit Number 4-6: Hands On: Model Regrouping 4-7: The Distributive Property 4-8: Multiply with Regrouping 4-9: Multiply by a Multi-Digit Number 4-10: Problem-Solving Investigation: Estimate or Exact Answer 4-11: Multiply Across Zeros Multiplication Using the Distributive Property [L] Multiplication – One-Digit by Multi-Digit [L] Multiplication Selected Response Practice [L] Multiplying Whole Numbers – Generic Rectangle [L] Base-10 Multiplication and Division Part I [L] Base-10 Multiplication and Division Part II [L] Problem Solving with Multiplication and Division [L] Carnival Tickets [IMT] Comparing Growth, Variation 1 [IMT] Comparing Growth, Variation 2 [IMT] Threatened and Endangered [IMT] SBAC Sample Questions Claim 1A: Four Operations Multiplication/Division Strategies for K-7
	4.OA.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 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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Essential Questions:
1. How can students apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers?
2. How can students, depending on the numbers and the context, select and accurately apply appropriate methods to estimate or mentally calculate products?
3. How can students develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems?
4. How can students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends?
5. How can students select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context?

Time Frame	Standard	Standard Description	Content	Resources
(Oct.-Nov.) **Chapter 5:** **Multiply with Two-Digit Numbers** **(Approx.** **9 days)**	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.	• Equal-sized groups • Repeated addition • Arrays • Area Models • Commutative Property • Associative Property • Importance of place value when multiplying • Partial Products • Distributive Property • Using open number lines to represent multiplication • Using bar models to represent multiplication • Using decomposition to multiply (any decomposition and by place value)	<u>**Chapter 5 – Multiply with Two-Digit Numbers (6 Lessons)**</u> 5-1: Multiply by Tens 5-2: Estimate Products 5-3: Hands On: Use the Distributive Property to Multiply 5-4: Multiply by a Two-Digit Number 5-5: Solve Multi-Step Word Problems 5-6: Problem-Solving Investigation: Make a Table <u>Multiplication/Division Strategies K-7</u> (GMR) <u>Area Model Through The Grades</u> [CP] <u>Multiplication Fact Mastery Through Multiple Methods</u> [L] <u>Properties of multiplication</u> [L] <u>Patterns: Foundations of Functions</u> <u>Solving Equations – Bar Models</u> [L] <u>Solving Equations – Decomposition</u> [L]

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Essential Questions:
1. How can students apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers?
2. How can students, depending on the numbers and the context, select and accurately apply appropriate methods to estimate or mentally calculate products?
3. How can students develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems?
4. How can students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends?
5. How can students select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context?

Time Frame	Standard	Standard Description	Content	Resources
(Nov.) **Chapter 6:** **Divide by a** **One-Digit** **Number** **(Approx.** **14 days)**	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.	• Equal-sized groups • Repeated addition • Arrays • Area Models • Commutative Property • Associative Property • Importance of place value when multiplying • Partial Products • Distributive Property • Using open number lines to represent multiplication • Using bar models to represent multiplication • Using decomposition to multiply (any decomposition and by place value)	**Chapter 6 – Divide by a One-Digit Number** **(11 Lessons)** 6-1: Divide by Multiples of 10, 100, and 1,000 6-2: Estimate Quotients 6-3: Hands On: Use Place Value to Divide 6-4: Problem-Solving Investigation: Make a Model 6-5: Divide with Remainders 6-6: Interpret Remainders 6-7: Place the First Digit 6-8: Hand On: Distributive Property and Partial Quotients 6-9: Divide Greater Numbers 6-10: Quotients with Zeros 6-11: Solve Multi-Step Word Problems Division — Multiple Representations[CP] Division — Divvy Out Greater Numbers[L] Division Algorithms [L]

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Essential Questions:
1. How can students apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers?
2. How can students, depending on the numbers and the context, select and accurately apply appropriate methods to estimate or mentally calculate products?
3. How can students develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems?
4. How can students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends?
5. How can students select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context?

Time Frame	Standard	Standard Description	Content	Resources
(Nov.) **Chapter 7:** **Patterns and Sequences** **(Approx. 12 days)**	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 rounding.	• Equal-sized groups • Repeated addition • Arrays • Area Models • Commutative Property • Associative Property • Importance of place value when multiplying • Partial Products • Distributive Property • Using open number lines to represent multiplication • Using bar models to represent multiplication • Using decomposition to multiply (any decomposition and by place value)	**Chapter 7 – Patterns and Sequences (9 Lessons)** 7-1: Nonnumeric Patterns 7-2: Numeric Patterns 7-3: Sequences 7-4: Problem-Solving Investigation: Look for a Pattern 7-5: Addition and Subtraction Rules 7-6: Multiplication and Division Rules 7-7: Order of Operations 7-8: Hands On: Equations with Two Operations 7-9: Equations with Multiple Operations Patterns: Foundations of Functions Solving Equations – Bar Models [L] Solving Equations – Decomposition [L] Double Plus One [IMT] Multiples of nine [IMT] SBAC Sample Questions Claim 1C: Patterns
	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.		

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Essential Questions:
1. How can students develop understanding of fraction equivalence and operations with fractions?
2. How can students recognize that two different fractions can be equal (e.g., 15/9 = 5/3), and develop methods for generating and recognizing equivalent fractions?
3. How can students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number?

Time Frame	Standard	Standard Description	Content	Resources
(Dec.) **Chapter 8:** **Fractions** **(Approx.** **13 days)** (Continues on next page)	4.NF.1	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ 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.	• Meaning of numerator and denominator • Equivalent fractions • Equivalent forms of 1 • Multiple representation of fractions (e.g., number line, area model)	**Chapter 8 – Fractions (10 Lessons)** 8-1: Factors and Multiples 8-2: Prime and Composite Numbers 8-3: Hands On: Model Equivalent Fractions 8-4: Equivalent Fractions 8-5: Simplest Form 8-6: Compare and Order Fractions 8-7: Use Benchmark Fractions to Compare and Order 8-8: Problem-Solving Investigation: Use Logical Reasoning 8-9: Mixed Numbers 8-10: Mixed Numbers and Improper Fractions Hundreds Chart [GMR] Prime Numbers and Factorization [CP] Click on: Sieve of Eratosthenes Prime Factorization Recognizing and Generating Equivalent Fractions [L] Simplifying Fractions [CP] Comparing and Ordering Fractions – Benchmark Fractions [CP] Comparing Fractions [L] Comparing Fractions Using the Complement [L] Money in the piggy bank [IMT] Explaining Fraction Equivalence with Pictures [IMT] Fractions and Rectangles [IMT]
	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 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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Time Frame	Standard	Standard Description	Content	Resources
(Dec.) **Chapter 8:** **(Continued)** **Fractions**	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.	• Meaning of numerator and denominator • Equivalent fractions • Equivalent forms of 1 • Multiple representation of fractions (e.g., number line, area model)	**Chapter 8 – Fractions (10 Lessons)** Comparing Fractions Using Benchmarks Game [IMT] Doubling Numerators and Denominators [IMT] Listing fractions in increasing size [IMT] Using Benchmarks to Compare Fractions [IMT] SBAC Sample Questions Claim 1F: Fraction Equivalence
	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 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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(Jan.) **Chapter 9:** **Operations** **with** **Fractions** **(Approx.** **12 days)** (Continues on next page)	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.* 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. 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.	• Meaning of numerator and denominator • Equivalent fractions • Equivalent forms of 1 • Multiple representation of fractions (e.g., number line, area model) • Multiplication of fractions • Adding fractions	**Chapter 9 – Operations with Fractions (9 Lessons)** 9-1: Hands On: Use Models to Add Like Fractions 9-2: Add Like Fractions 9-3: Hands On: use Models to Subtract Like Fractions 9-4: Subtract Like Fractions 9-5: Problem-Solving Investigation: Work Backward 9-6: Add Mixed Numbers 9-7: Subtract Mixed Numbers 9-8: Hands On: Model Fractions and Multiplication 9-9: Multiply Fractions by Whole Numbers Decomposing Fractions [L] Adding Fractions [CP] Fraction Bars [GMR] Number Lines, Fractions, and Bar Models [L] Converting – improper fractions and mixed numbers [L] Comparing Sums of Unit Fractions [IMT] Writing a Mixed Number as an Equivalent Fraction [IMT]

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3. How can students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number?

Time Frame	Standard	Standard Description	Content	Resources
(Jan.-Feb.) **Chapter 9:** **(Continued)** **Operations** **with** **Fractions**	4.NF.4	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 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).* 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 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)* 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?*	• Meaning of numerator and denominator • Equivalent fractions • Equivalent forms of 1 • Multiple representation of fractions (e.g., number line, area model) • Multiplication of fractions • Adding fractions	**<u>Chapter 9 – Operations with Fractions (continued)</u>** Multiplying Fractions [CP] Extending Multiplication From Whole Numbers to Fractions [IMT] Sugar in six cans of soda [IMT] SBAC Sample Questions Claim 1G: Build fractions from unit fractions

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Essential Questions:
1. How can students develop understanding of fraction equivalence with decimals?

Time Frame	Standard	Standard Description	Content	Resources
(Feb.-March) **Chapter 10:** **Fractions** **and Decimals** **(Approx.** **11 days)**	4.NF.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.*	• Meaning of numerator and denominator • Equivalent fractions • Equivalent forms of 1 • Multiple representation of fractions (e.g., number line, area model) • Multiplication of fractions • Adding fractions • Equivalence between fractions and decimals	**Chapter 10 – Fractions and Decimals (8 Lessons)** 10-1: Hands On: Place Value Through Tenths and Hundredths 10-2: Tenths 10-3: Hundredths 10-4: Hands On: Model Decimals and Fractions 10-5: Decimals and Fractions 10-6: Use Place Value and Models to Add 10-7: Compare and Order Decimals 10-8: Problem-Solving Investigation: Extra or Missing Information Equivalent Decimals and Fractions [L] Adding Tenths and Hundredths [IMT] Expanded Fractions and Decimals [IMT] How Many Tenths and Hundredths? [IMT] Using Place Value [IMT] SBAC Sample Questions Claim 1H: Decimals and Fractions
	4.NF.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.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 the number line or another visual model. CA		

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Essential Questions:
1. How can students solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit?
2. How can students represent and interpret data?
3. How can students, through geometric measurement, understand concepts of angles and measure angles?

Time Frame	Standard	Standard Description	Content	Resources
(March-April) **Chapter 11:** **Customary Measurement** **(Approx.** **13 days)**	4.MD.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. *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), ...*	• Conversion of measurement units • Data representation	**Chapter 11 – Customary Measurement (10 Lessons)** 11-1: Customary Units of Length 11-2: Convert Customary Units of Length 11-3: Customary Units of Capacity 11-4: Convert Customary Units of Capacity 11-5: Customary Units of Capacity 11-6: Convert Customary Units of Weight 11-7: Convert Units of Time 11-8: Display Measurement Data in a Line Plot 11-9: Solve Measurement Problems 11-10: Problem-Solving Investigation: Guess, Check, and Revise Who is the tallest? [IMT] Measurement [L] Line Plots [L] Button Diameters [IMT] SBAC Sample Questions Claim 1I: Measurement conversion SBAC Sample Questions Claim 1J: Represent and interpret data
	4.MD.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.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. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*		

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Essential Questions:
1. How can students solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit?
2. How can students represent and interpret data?
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Time Frame	Standard	Standard Description	Content	Resources
(April) **Chapter 12:** **Metric Measurement** **(Approx.** **9 days)**	4.MD.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. *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), ...*	• Conversion of measurement units • Data representation	**Chapter 12 – Metric Measurement (6 Lessons)** 12-1: Metric Units of Length 12-2: Metric Units of Capacity 12-3: Metric Units of Mass 12-4: Problem-Solving Investigation: Make an Organized List 12-5: Convert Metric Units 12-6: Solve Measurement Problems Measurement [L]
	4.MD.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.		

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Essential Questions:
1. How can students solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit?
2. How can students represent and interpret data?
3. How can students, through geometric measurement, understand concepts of angles and measure angles?

Time Frame	Standard	Standard Description	Content	Resources
(May) **Chapter 13:** **Perimeter** **and Area** **(Approx.** **7 days)**	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.	• Relationship of perimeter and area	**Chapter 13 – Perimeter and Area (5 Lessons)** 13-1: Measure Perimeter 13-2: Problem-Solving Investigation: Solve a Simpler Problem 13-3: Hands On: Model Area 13-4: Measure Area 13-5: Relate Area and Perimeter Area and Perimeter — Decomposition [L] Discovering Area and Perimeter [L] Same Perimeter – Different Area [L] Same Area – Different Perimeter [L] Karl's Garden [IMT]

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Essential Questions:
1.   How can students solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit?
2.   How can students represent and interpret data?
3.   How can students, through geometric measurement, understand concepts of angles and measure angles?

Time Frame	Standard	Standard Description	Content	Resources
(May-June) **Chapter 14:** **Geometry** **(Approx.** **14 days)** (Continues on next page)	4.MD.5	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. b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.	• Classification of shapes • Symmetry • Relationships among shapes based on attributes • Conversion of measurement units • Data representation • Measurement of angles	**Chapter 14 – Geometry (11 Lessons)** 14-1: Draw Points, Lines, and Rays 14-2: Draw Parallel and Perpendicular Lines 14-3: Hands On: Model Angles 14-4: Classify Angles 14-5: Measure Angles 14-6: Draw Angles 14-7: Solve Problems with Angles 14-8: Triangles 14-9: Quadrilaterals 14-10: Draw Lines of Symmetry 14-11: Problem-Solving Investigation: Make a Model Classifying Triangles [CP] Quadrilaterals [CP] Measuring Angles [IMT] Finding an unknown angle [IMT] SBAC Sample Questions Claim 1K: Geometric measurement: Angles
	4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.		
	4.MD.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.		

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Essential Questions:
1. How can students describe, analyze, compare, and classify two-dimensional shapes?
2. How can students, through building, drawing, and analyzing two-dimensional shapes, deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry?

Time Frame	Standard	Standard Description	Content	Resources
(April-June) **Chapter 14:** **(Continued)** **Geometry**	4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	• Classification of shapes • Symmetry • Relationships among shapes based on attributes • Conversion of measurement units • Data representation • Measurement of angles	**Chapter 14 – Geometry (continued)** Lines, rays, and segments [L] Classifying Triangles [CP] Quadrilaterals [CP] Defining Attributes of Rectangles and Parallelograms [IMT] What shape am I? [IMT] Finding Lines of Symmetry [IMT] Lines of symmetry for quadrilaterals [IMT] Lines of symmetry for triangles [IMT] SBAC Sample Questions Claim 1L: Lines, Angles, and Properties
	4.G.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. (Two dimensional shapes should include special triangles, e.g., equilateral, isosceles, scalene, and special quadrilaterals, e.g., rhombus, square, rectangle, parallelogram, trapezoid.) CA		
	4.G.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.		