



4th Grade Math Course of Study

MATH’S Connection to Social Justice Standards

In Math Class, Students will have the opportunity to develop these standards:

- 4. Students will express pride, confidence and healthy self-esteem without denying the value and dignity of other people.
- 6. Students will express comfort with people who are both similar to and different from them and engage respectfully with all people.
- 9. Students will respond to diversity by building empathy, respect, understanding and connection.
- 11. Students will recognize stereotypes and relate to people as individuals rather than representatives of groups.
- 18. Students will speak up with courage and respect when they or someone else has been hurt or wronged by bias.

MATH’S Connection to Vision of a Lakewood Graduate

In Math Class, Students will have the opportunity to develop these standards:

Communication -

- Come organized and prepared with homework or materials to accomplish the day’s work
- Expresses thoughts in a written and oral format on paper and in discussions
- Exhibits active listening, awareness and sensitivity to the audience
- Advocates for self and others
- Gives and receives constructive feedback
- Presents thoughts logically, clearly and concisely
- Willing and able to consider diverse points of view
- Asks questions to deepen understanding

Collaboration -

- Engages in opportunities to work with others
- Develops rapport with others in the working group
- Engages in team problem solving
- Uses clear and thoughtful communication skills
- Seeks input and is open to new ideas

Growth Mindset -

- Accountability
- Perseverance in the face of obstacles
- Seeing failure as an opportunity for learning
- The power of YET “willingness to try”
- Reflection
- Goal setting in life and work
- Belief in self-improvement
- Inspired by the success of others
- Focus on the process rather than the outcome
- Gives, receives and incorporates constructive feedback
- Seeks help when necessary

Global Awareness -

- Seeks to understand diverse perspectives
- Feels empowered to make a difference
- Engages in opportunities to promote equity and fairness
- Engages in activities that promote sustainability and a more promising future

Empathy -

- Encourages others
- Considers others’ perspectives
- Demonstrates kindness and acceptance
- Listens actively to others
- Shows appreciation of difference in one another
- Exhibits awareness of others’ challenges
- Develops authentic relationships
- Understands the emotions of others
- Shows awareness of how our actions affect others

Critical and Creative Thinking -

- Generate ideas, possibilities and actions
- Able to provide evidence of their thinking
- Anticipate possible outcomes
- Analyzes, synthesize and evaluate reasoning and procedures
- Vet sources and utilize multiple resources
- Reflect on thinking, processes and outcomes
- Make connections across content areas
- Willing and able to consider diverse points of view



Unit: Operations and Algebraic Thinking

Essential Questions: How can we use mathematical operations and patterns to solve real-world problems and make sense of the world around us?

Big Idea: Use the four operations with whole numbers to solve problems.

Big Idea: Gain familiarity with factors and multiples

Big Idea: Generate and analyze patterns

Unit Vocabulary: multiplication/multiply, division/divide, addition/add, subtraction/subtract, equations, multiplicative comparison, additive comparison, unknown, remainders, reasonableness, mental computation, estimation, rounding, factor pairs, factor, multiple, prime, and composite

Suggested Pacing	Content Standards	Learning and Performance Expectations What must students know and be able to do?	Assessment of Learning Options How will we know if they learned this skill?	Resources Options
Module 1	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.	- Students should be able to identify and verbalize which quantity is being multiplied and which number tells how many times. - Students should be able to translate comparative situations into equations with an unknown and solve. 4 28 28 is 7 times as many as 4 $28=7\times4$	Module 1 Topic A Quiz Module 2 Topic D Quiz Module 1 Assessment	Compare with multiplication (practice) Khan Academy https://www.commoncoresheets.com/interpreting-multiplication-problems/647/download?version=1&subject=math&topic=multiplication&sheet=interpreting&pages%5Bws%5D=1&pages%5Bans%5D=1&sheet_language=english Interpreting Multiplication Equations as a Comparison Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Compare with multiplication word problems (practice) Khan Academy 3 ACT TASK Dill-er Up
Module 1,2	4.OA.2 Multiply or divide to solve word problems involving	Unknown Product: A blue scarf costs \$3. A red scarf costs 6 times as much.	Module 1 Topic A Quiz Module 1 Assessment	Multiplication and division word problems (practice) Khan Academy



	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.	How much does the red scarf cost? ($3 \times 6 = p$) Group Size Unknown: A book costs \$18. That is 3 times more than a DVD. How much does a DVD cost? ($18 \div p = 3$ or $3 \times p = 18$) Number of Groups Unknown: A red scarf costs \$18. A blue scarf costs \$6. How many times as much does the red scarf cost compared to the blue scarf? ($18 \div 6 = p$ or $6 \times p = 18$) Additive comparisons focus on the difference between two quantities. Multiplicative comparisons focus on comparing two quantities by showing that one quantity is a specified number of times larger or smaller than the other. When distinguishing multiplicative comparison from additive comparison, students should note that: • additive comparisons focus on the difference between two quantities (e.g., Deb has 3 apples and Karen has 5 apples. How many more apples does Karen have?). A simple way to remember this is, “How many more?” • Multiplicative comparisons focus on comparing two quantities by showing that one quantity is a specified number of times as large as or as small as the other (e.g., Deb ran 3 miles. Karen ran 5 times as many miles as Deb. How many miles did Karen run?). A simple way to remember this is “How many times as much?” or “How many times as many?”.	Module 2 Topic B Quiz Module 2 Topic D Quiz Module 2 Assessment	https://www.commoncoresheets.com/solving-multiplicative-comparison-problems-with-a-table/674/download?version=1 https://www.commoncoresheets.com/word-multiplication-comparisons-within-100/689/download?version=1
Module 1,3	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.	This standard references interpreting remainders. Remainders should be put into context for interpretation. Ways to address remainders: • Remain as a left over • Partitioned into fractions or decimals • Discarded leaving only the whole number answer • Increase the whole number answer by one • Round to the nearest whole number for an approximate result	Multi-Step Problems Using the Four Operations Module 1 Topic D Quiz Module 3 Topic F Quiz Module 1 Assessment Module 3 Assessment	2-step estimation word problems (practice) Khan Academy Represent multi-step word problems using equations (practice) Khan Academy Multi-step word problems with whole numbers (practice) Khan Academy Two Step Problems (Multiply then Divide) Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Two Step Problems (Multiply then Subtract) Worksheet Download Free - Distance Learning,



				worksheets and more: CommonCoreSheets 3 ACT TASK Where's the Beef (see NBT5) Krispy Kreme Me (see NBT5)
Module 2	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.	• A number can be multiplicatively decomposed into factor pairs and expressed as a product of these factor pairs. • A prime number has only two factors: one and itself (only one factor pair). • A composite number has more than two factors (more than one factor pair). • Any whole number is a multiple of each of its factors skip-count to find multiples and recognize relationships between factors and multiples—a number is a multiple of each of its factors and factors can be used to find other factors.	Module 2 Topic E Quiz Module 2 Assessment	Identify prime numbers (practice) Khan Academy Identify composite numbers (practice) Khan Academy Identify factors (practice) Khan Academy Identify multiples (practice) Khan Academy Relate factors and multiples (practice) Khan Academy Factor pairs (practice) Khan Academy 3 ACT TASK Dill-'er Up (see OA1)
Module 2	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.	Patterns involving numbers or symbols either repeat or grow. Students need multiple opportunities creating and extending number and shape patterns. Numerical patterns allow students to reinforce facts and develop fluency with operations. Patterns and rules are related. A pattern is a sequence that repeats the same process over and over. A rule dictates what that process will look like. Students investigate different patterns to find rules, identify features in the patterns, and justify the reason for those features.	Module 2 Topic E Quiz Module 2 Assessment	Patterns with numbers (practice) Khan Academy Patterns with shapes (practice) Khan Academy



Unit: Numbers and Operations in Base Ten

Essential Questions: How do we understand and manipulate numbers within our base-ten system to solve real-world problem and make mathematical connections?
Big Idea: Generalize place value understanding for multi-digit whole numbers less than or equal to 1,000,000.
Big Idea: Use place value understanding and properties of operations to perform multi-digit arithmetic with whole numbers less than or equal to 1,000,000.
Big Idea: Compare and round numbers using a variety of strategies.
Vocabulary: **place value, greater than, less than, equal to, <, >, =, comparisons/compare, round, base-ten numerals (standard form), number name (written form), expanded form, inequality, and expression. add, addend, sum, subtract, difference, equation, strategies, properties of operations, algorithm, rectangular arrays, area model, multiply, divide, factor, product, quotient, and reasonableness.**

Suggested Pacing	Content Standards	Learning and Performance Expectations What must students know and be able to do?	Assessment of Learning Options How will we know if they learned this skill?	Resources Options
Module 1	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 by applying concepts of place value, multiplication, or division.	- In the base-ten system, the value of each place is 10 times the value of the place to the immediate right. - Each period of three digits separated by commas is read as hundreds, tens, and ones, followed (when appropriate) by the name of the period, e.g., 123,456 is read as one hundred twenty-three thousand, four hundred fifty-six. Students should know to the millions place value. - Numbers can be expressed in standard form, word form, and expanded form. 56,348: Standard Fifty six thousand three hundred forty eight: Word 50,000+6,000+300+40+8: Expanded - Rounding helps solve problems mentally and assess the reasonableness of an answer.	Module 1 Topic B Quiz Module 1 Assessment	Place value when multiplying and dividing by 10 (practice) Khan Academy Multiplying 10s Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Multiply and divide by 10 (practice) Khan Academy Place value blocks (practice) https://www.commoncoresheets.com/expressing-value-with-place-values-over-ten/963/download?version=1 Filling in Missing Place Value over 10. Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Creating largest or smallest number (practice) Khan Academy Creating largest or smallest number (practice) Khan Academy Divide whole numbers by 10 (practice) Khan Academy Multiply whole numbers by 10 (practice) Khan Academy Filling in Missing Place Value over 10. Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets
Module 1	4.NBT.2 Read and write multi-digit whole numbers using standard form, word form, and expanded form. Compare two multi-digit numbers based on	Comparing Numbers Compare numbers based on place-value understanding— with the same number of digits; with the same leading digits; and with different leading digits and different number of digits.	Module 1 Topic C Quiz Module 1 Assessment	Identify value of a digit (practice) Khan Academy Write whole numbers in expanded form (practice) Khan Academy Expanded to Numeric Within 1 Million Worksheet Download Free



	meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons. Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.	• Connect the mathematical language to the use of symbols $>$, $=$, and $<$ when describing the relationship between the numbers. • Write two true inequality statements using symbols and words for a pair of numbers, e.g., $3,012 < 4,542$ and $4,542 > 3,012$. • Create numbers given specific criteria, e.g., Create a number that has 3 in the thousands place, 5 in the millions place, etc.		- Distance Learning, worksheets and more: CommonCoreSheets Compare multi-digit numbers (practice) Khan Academy Comparing Within 1 Million Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Place value tables (practice) Write numbers in written form (practice) Khan Academy Numeric to Word Within 1 Million Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Word to Numeric Within 1 Million Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Compare multi-digit numbers word problems (practice) Khan Academy Compare multi-digit numbers written in different forms (practice) Khan Academy Write whole numbers in different forms (practice) Khan Academy Regroup whole numbers (practice) Khan Academy
Module 1	4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place through 1,000,000.	Rounding • Explore rounding by using the location of a given number on a model, e.g., number line, number chart, etc. • Round numbers based on place-value understanding. • Explain and reason when rounding. Determine appropriate rounding strategy to make useful estimates given the context. • Develop and generalize rounding rules for larger numbers. • Identify or create numbers that will round to a chosen number, e.g., Create a number that will round to 10,500. • Explore the purposes of rounding.	Module 1 Topic C Quiz Module 1 Assessment	Round whole numbers (practice) Khan Academy Round whole numbers to different place values (practice) Khan Academy Round Within 1 Million Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Round whole numbers word problems (practice) Khan Academy
Module 1	4.NBT.4 Fluently add and subtract multi-digit whole numbers using a standard algorithm.	Addition/Subtraction • Estimate the solution of an addition or subtraction situation. • Connect a standard algorithm to an efficient strategy. • Explain and justify the reasoning used in a standard algorithm. • Analyze other students' use of a standard algorithm and explain any errors.	Multi-Digit Addition and Subtraction Using the Standard Algorithm Module 1 Topic D Quiz Module 1 Assessment	Multi-digit addition (practice) Khan Academy 4 Digit Plus 4 Digit Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Multi-digit subtraction (practice) Khan Academy https://www.commoncoresheets.com/4-digit-minus-4-digit/864/d



		• Determine reasonableness of a solution and compare to initial estimation. • Use an efficient standard algorithm accurately and flexibly.		ownload?version=1 Subtracting Across Zeroes Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets
Module2 Module3	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.	NBT 5-6 Multiplication/Division • Explore number relationships and look for patterns. • Multiply a whole number of up to four digits by a one-digit whole number. • Multiply two two-digit numbers. • Illustrate and explain the relationship between multiplication and division. • Solve using strategies that may include the following: decomposing factors; using the relationship between multiplication and division; creating equivalent but easier or known products, doubles, and properties of operations, etc. • Apply the conceptual understanding of properties to multiplication and division. • Estimate the solution of a multiplication or division problem. • Use visual representations such as area models and arrays to draw connections to equations. • Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors. • Explore and explain how zeroes affect division and multiplication: in the dividends and products; within the process of dividing and multiplying; and in the quotient or product. • Determine reasonableness of a solution, and compare it to initial estimation. • Explore division problems that result in remainders. • Determine whether the remainder is left alone, is discarded, is written as a fraction or decimal, or forces the quotient to increase.	Module 2 Topic B Quiz Module 2 Topic C Quiz Module 2 Assessment Module 3 Topic A, C, D Quiz Module 3 Assessment Ohio Readiness Assessment: 4th Grade Mathematics Checkpoint: Multiplication/Division	Multiply without regrouping (practice) Khan Academy Multiply with regrouping (practice) Khan Academy Multiply 2-digit numbers (practice) Khan Academy Multiplication with Helper Grid Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Understand multiplying by a multiple of 10, 100, and 1000 (practice) Khan Academy Multiplying using Arrays (with factors of 10) Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Multiply using partial products (practice) Khan Academy Multiply 2-digits by 1-digit with area models (practice) Khan Academy https://www.commoncoresheets.com/multiplying-using-arrays-wi th-factors-of-10/667/download?version=1 Multiplying using Arrays Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Multiply 2-digit numbers with area models (practice) Khan Academy Multiply with partial products (2-digit numbers) (practice) Khan Academy Multiply by 10s Khan Academy Multiply 3- and 4-digits by 1-digit with area models (practice) Khan Academy Multiply 1-digit numbers by 10, 100, and 1000 (practice) Khan Academy Estimate products (2-digit numbers) (practice) Khan Academy Multiply 3- and 4-digits by 1-digit with distributive property (practice) Khan Academy Vertical 3 digit × 1 digit Worksheet Download Free - Distance



				Learning, worksheets and more: CommonCoreSheets Multiply 2-digits by 1-digit with distributive property (practice) Khan Academy Multiply 1-digit numbers by a multiple of 10, 100, and 1000 (practice) Khan Academy Estimate products (1-digit times 2, 3, and 4-digit) (practice) Khan Academy 3 ACT TASK- Array-bow of Colors Krispy Kreme Me Where's the Beef
Module 2 Module3	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.	See above	See above	Preparing for Long Division Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Divide multi-digit numbers by 2, 3, 4, and 5 (remainders) (practice) Khan Academy Divide multi-digit numbers by 6, 7, 8, and 9 (remainders) (practice) Khan Academy Vertical Division with a Helper Grid Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Divide using place value (practice) Khan Academy Interpret remainders (practice) Division Khan Academy Divide with remainders (2-digit by 1-digit) (practice) Khan Academy Divide multiples of 10, 100, and 1,000 by 1-digit numbers (practice) Khan Academy Estimate quotients (3- and 4-digit divided by 1-digit) (practice) Khan Academy Create division equations with area models (practice) Khan Academy Divide by 1-digit numbers with area models (practice) Khan Academy Estimate to divide by 1-digit numbers (practice) Khan Academy 3 ACT TASK Spinner



Unit: Numbers and Operations- Fractions

Essential Questions: How do we understand, compare, and manipulate fractions to solve real-world problems?
Big Idea: Extend understanding of fraction equivalence and ordering limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
Big Idea: Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100. (Fractions need not be simplified).
Big Idea:Understand decimal notation for fractions, and compare decimal fractions limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.
Vocabulary:
partition(ed), fraction, unit fraction, equivalent, expression, multiple, reason, denominator, numerator, comparison/compare, <, >, =, and benchmark fraction
operations, addition/joining, subtraction/separating, fraction, unit fraction, equivalent, multiple, reason, denominator, numerator, decomposing, mixed number, properties of operations, multiply, and multiple, reasoning, decimals, tenths, hundredths, multiplication.

Suggested Pacing	Content Standards	Learning and Performance Expectations What must students know and be able to do?	Assessment of Learning Options How will we know if they learned this skill?	Resources Options
Module 4	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.	NF 1-2 • Recognize and generate equivalent fractions on number lines or using other length models (include a whole number and values greater than a whole; use denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100). • Given pairs of length models divided into different numbers of equal parts, explore how both of the models can illustrate equivalent quantities. • Given pairs of length models divided into different numbers of equal parts with a fraction for each model, explore and explain which fraction is larger, smaller, or equivalent. Represent the comparison of the fractions using >, =, or <. • Represent fractions with different numerators and denominators given pairs of visual models such as shaded area models (with the same model unit) Determine if the shaded portions are equal. Represent the comparison of the fractions using >, =, or <. Justify answers. • Explore the use of benchmark fractions of 0, 1/2 , and 1 to compare two fractions with different numerators and different denominators. • Use models to explore what is required to maintain equivalent fractions when a denominator is multiplied by a number, e.g., doubling or tripling the number of parts. • Use models to explore what is required to maintain equivalent fractions when a numerator is multiplied by a number. • Generate equivalent fractions and explain why the fractions are equivalent.	Fraction Concepts Module 4 Topic B Quiz Module 4 Assessment	Equivalent fractions (practice) Khan Academy Drawing Equivalent Visual Fractions Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Equivalent fractions (fraction models) (practice) Khan Academy Equivalent fractions (number lines) (practice) Khan Academy https://www.commoncoresheets.com/filling-in-a-pattern/447/download?version=1 Equivalent Fractions (Missing Number) Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets
Module 4	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	See above	Module 4 Topic C Quiz Module 4 Assessment	Compare fractions with different numerators and denominators (practice) Khan Academy Comparing Numerically (Different Denominator) Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets



	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.			Common denominators (practice) Khan Academy Compare fractions using benchmark (practice) Khan Academy https://www.commoncoresheets.com/determining-value-relative-to-half/499/download?version=1 Visually compare fractions with unlike denominators (practice) Khan Academy Fractions of different wholes (practice) Khan Academy Compare fractions word problems (practice) Khan Academy
Module 4	4.NF.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.	NF 3-4 • Express a fraction as a unit fraction and a factor. • Use models to illustrate renaming a fraction as a mixed number and vice versa. • Explore and explain decomposing a fraction into a sum of fractions with the same denominator in more than one way. • Write an equation to show the decomposition of a fraction. • Add and subtract fractions with like denominators using models. • Add and subtract mixed numbers with like denominators using models. Add and subtract a fraction and a whole number. • Explore equal sharing problems involving 2, 3, 4, 5, 6, 8, 10, and 12 sharers and having answers that are whole numbers, mixed numbers, or fractions less than 1, e.g., Ten children are sharing 14 liters of punch. If they each are to have the same amount, how much punch should each child get? Between what two whole numbers will your answer lie? • Solve multiple groups involving fractions such as $1/2$, $1/4$, $3/4$, $1/3$, $2/3$, and $1/10$ in each group including problems using mixed numbers, e.g., Five children are having lunch. Each child is to get $1\frac{3}{4}$ of a sandwich. How many sandwiches are needed? Between what two whole numbers does your answer lie? • Represent real-world problems with visual models and with equations (involving addition or subtraction of fractions with like denominators or multiplication of a fraction by a whole number), and justify the solutions. • Solve real-world problems that will result in various equivalent answers, having students explain why the solutions are equivalent. • Solve problems where the unit or the amount counted as the whole represents various amounts, e.g., using pattern blocks, make the hexagon a whole, 1 trapezoid a whole, 2 trapezoids a whole, 2 pizzas the whole, etc.	See below a,b,c,d	Write mixed numbers and improper fractions (practice) Khan Academy Add and subtract mixed numbers (no regrouping) (practice) Khan Academy Add fractions with common denominators (practice) Khan Academy Adding Fractions Visual (combining) Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Subtract fractions with common denominators (practice) Khan Academy Add and subtract mixed numbers (with regrouping) (practice) Khan Academy Add and subtract fractions word problems (same denominator) (practice) Khan Academy Decompose fractions (practice) Khan Academy Add and subtract mixed numbers word problems (like denominators) (practice) Khan Academy
Module 4	4.NF.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	See above	Module 4 Topic A Quiz Module 4 Topic D Quiz Module 4 Assessment	Add fractions with common denominators (practice) Khan Academy Subtract fractions with common denominators (practice) Khan Academy



				Decompose fractions visually (practice) Khan Academy
Module 4	4.NF.3b 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: $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$; $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$; $2\frac{1}{8} = 1 + 1 + \frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{1}{8}$.	See above	Module 4 Topic A Quiz Module 4 Topic D Quiz Module 4 Assessment	Decompose fractions (practice) Khan Academy
Module 4	4.NF.3c 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.	See above	Module 4 Topic E Quiz Module 4 Assessment	Add and subtract mixed numbers (no regrouping) (practice) Khan Academy Add and subtract mixed numbers (with regrouping) (practice) Khan Academy Add and subtract mixed numbers word problems (like denominators) (practice) Khan Academy
Module 4	4.NF.3d 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.	See above	Module 4 Topic D Quiz Module 4 Topic E Quiz Module 4 Assessment	Add and subtract fractions word problems (same denominator) (practice) Khan Academy
Module 4	4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.	Use unit form and the associative property to multiply a fraction by a whole number.	See below a,b,c	Compare fractions with different numerators and denominators (practice) Khan Academy Common denominators (practice) Khan Academy Compare fractions using benchmark (practice) Khan Academy Multiply fractions and whole numbers with fraction models (practice) Khan Academy Equivalent whole number and fraction multiplication expressions (practice) Khan Academy Multiply fractions and whole numbers (practice) Khan Academy Multiply mixed numbers and whole numbers (practice) Khan



				Academy Interpret multiplying fraction and whole number word problems (practice) Khan Academy 3 ACT TASK Do-the Dew Drip Drop The Juicer
Module 4	4.NF.4a 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 $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$ or $5/4 = (1/4) + (1/4) + (1/4) + (1/4) + (1/4)$.	• Decompose non-unit fractions into a product of a whole number and a unit fraction. • Describe a fraction as a multiple of a unit fraction.	Module 4 Topic F Quiz Module 4 Assessment	Multiply fractions and whole numbers on the number line (practice) Khan Academy Multiply unit fractions and whole numbers (practice) Khan Academy Multiply fractions and whole numbers with fraction models (practice) Khan Academy Equivalent whole number and fraction multiplication expressions (practice) Khan Academy Multiply mixed numbers and whole numbers (practice) Khan Academy
Module 4	4.NF.4b 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 $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)	• Multiply a fraction by a whole number using the associative property. • Decompose the fraction into a whole number times a unit fraction and then apply the associative property. • Multiply a whole number and a mixed number using the distributive Use the context of the problem to make decisions about when to rename fractions greater than one as a mixed number property.	Module 4 Topic F Quiz Module 4 Assessment	Multiply fractions and whole numbers on the number line (practice) Khan Academy Multiply fractions and whole numbers with fraction models (practice) Khan Academy Equivalent whole number and fraction multiplication expressions (practice) Khan Academy Multiply fractions and whole numbers (practice) Khan Academy Multiply mixed numbers and whole numbers (practice) Khan Academy
Module 4	4.NF.4c Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to	See above	Module 4 Topic F Quiz Module 4 Assessment	Multiply fractions and whole numbers word problems (practice) Khan Academy Interpret multiplying fraction and whole number word



	represent the problem.			problems (practice) Khan Academy
Module 5	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 $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$. In general, students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators, but addition and subtraction with unlike denominators is not a requirement at this grade.	NF 5-7 Model and explore fractions with denominators of 10 or 100. • Explore and generate an equivalent fraction in tenths as a fraction in hundredths. • Describe and express a fraction with a denominator of 10 or 100 as a decimal. • Explore and express a decimal up to hundredths as a fraction. • Compare, discuss, and justify two fractions with denominators of 10 or 100 using visual models. • Recognize that decimals can only be compared when the decimals being compared refer to the same whole. • Compare two decimals using visual models to hundredths; record the results using $>$, $=$, or $<$; and justify the conclusions. • Add and subtract fractions with denominators of 10 and 100.	Module 5 Topic B Quiz Module 5 Topic D Quiz Module 5 Assessment	Equivalent expressions with common denominators (denominators 10 & 100) (practice) Khan Academy Decompose fractions with denominators of 100 (practice) Khan Academy Add fractions (denominators 10 & 100) (practice) Khan Academy Equivalent fractions with fraction models (denominators 10 & 100) (practice) Khan Academy Equivalent fractions (denominators 10 & 100) (practice) Khan Academy
Module 5	4.NF.6 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite $\frac{62}{100}$ as 0.62; describe a length as 0.62 meters; locate 0.62 on a number line diagram.	• Students record mixed numbers of ones, tenths, and hundredths in fraction form, decimal form, and unit form and express mixed numbers with units of tenths and hundredths in expanded form. • Students see numbers can be represented in different ways.	Module 5 Topic A Quiz Module 5 Topic B Quiz Module 5 Assessment	Write decimals as fractions (practice) Khan Academy Decimals on the number line: tenths (practice) Khan Academy Decimals on the number line: hundredths (practice) Khan Academy Write decimals and fractions greater than 1 shown on grids (practice) Khan Academy Write decimals and fractions shown on number lines (practice) Khan Academy Write common fractions as decimals (practice) Khan Academy Write common decimals as fractions (practice) Khan Academy Relate decimals and fractions in words (practice) Khan Academy Decimals on the number line: hundredths 0-0.1 (practice) Khan Academy Write fractions as decimals (denominators of 10 & 100) (practice) Khan Academy



				Write decimals and fractions shown on grids (practice) Khan Academy Write decimals and fractions greater than 1 shown on number lines (practice) Khan Academy Decimals in words (practice) Khan Academy Decimal place value with regrouping (practice) Khan Academy Decimals on the number line: tenths 0-1 (practice) Khan Academy
Module 5	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 a visual model.	- Students then use an area model, number line, and place value disks to represent decimal numbers. - Students express decimal numbers in decimal form, fraction form, and unit form. They compare numbers by using different strategies such as making like units, comparing the value of each digit starting with the largest unit, and using mental math strategies. - Students apply their knowledge to compare mixed numbers and to order decimal numbers.	Module 5 Topic C Quiz Module 5 Assessment Ohio Readiness Assessment: Mathematics Checkpoint:Grade 4 Fractions	Compare decimals and fractions in different forms (practice) Khan Academy Compare decimals (tenths and hundredths) (practice) Khan Academy Order decimals and fractions in different forms (practice) Khan Academy Compare decimals visually (practice) Khan Academy

Unit: Measurement

Essential Questions: How do we collect, analyze, and use data to make informed decisions?



Big Idea: Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Big Idea: Geometric measurement: understand concepts of angle and measure angles.
Big Idea: Represent and interpret data.
Vocabulary:
measure, metric, customary, convert/conversion, relative size, liquid volume, mass, length, distance, kilometer (km), meter (m), centimeter (cm), kilogram (kg), gram (g), liter (L), milliliter (mL), inch (in), foot (ft), ounce (oz), pound (lb), time, hour, minute, second, equivalent, operations, add, subtract, multiply, divide, fractions, decimals, area, and perimeter, data, line plot, length, and fractions, measure, point, end point, geometric shapes, ray, angle, circle, fraction, intersect, one-degree angle, protractor, decomposed, addition, subtraction, unknown, obtuse, and acute, decomposing, non-overlapping, and adding area.

Suggested Pacing	Content Standards	Learning and Performance Expectations What must students know and be able to do?	Assessment of Learning Options How will we know if they learned this skill?	Resources Options
Module 1,2,3	4.MD.1 Know relative sizes of the metric measurement units within one system of units. Metric units include kilometer, meter, centimeter, and millimeter; kilogram and gram; and liter and milliliter. Express a larger measurement unit in terms of a smaller unit. Record measurement conversions in a two-column table. For example, express the length of a 4-meter rope in centimeters. Because 1 meter is 100 times as long as a 1 centimeter, a two-column table of meters and centimeters includes the number pairs 1 and 100, 2 and 200, 3 and 300,...	Metric Units • Larger units can be expressed in terms of smaller units. • The number of units used to measure an object will depend on the size of the unit of measure. • The larger the unit, the smaller the measurement reads; the smaller the unit, the larger the measurement reads. • Metric units are related by powers of ten. 1 kilometer = 1,000 meters, 1 meter = 100 centimeters, 1 centimeter = 10 millimeters; 1 kilogram = 1,000 grams; and 1 liter = 1,000 milliliters. Money • Answers to money problems can include the dollar symbol, \$, and decimal point placed appropriately in decimal notation. • The dollar symbol and the cent symbol are not used simultaneously. Time • Answers to time problems should include a.m. and p.m. as appropriate. • Noon is 12:00 p.m. • Midnight is 12:00 a.m. Metric Units • Explore the metric system using appropriate tools (metric rulers, meter sticks, balance scales, etc.) • Explore the units millimeter and milliliter. • Know relative sizes of the metric measurement units within one system of units: length – kilometer, meter, centimeter, and millimeter; mass – kilogram and gram; and liquid volume – liter and milliliter.	Module 1 Topic E Quiz Module 1 Assessment Module 2 Topic D Quiz Module 2 Assessment Module 3 Topic E Quiz Module 3 Assessment	Estimating time (seconds, minutes, and hours) (practice) Khan Academy Estimate volume (milliliters and liters) (practice) Khan Academy Convert to smaller units (mL and L) (practice) Khan Academy Estimating length (mm, cm, m, km) (practice) Khan Academy Determining Appropriate Measurement (Metric) Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Estimating Length (Metric) Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Convert to smaller units (g and kg) (practice) Khan Academy Comparing Weights Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Convert to smaller units (mm, cm, m, & km) (practice) Khan Academy



		• Explore and explain larger measurement units in terms of smaller units, e.g., 5 kilograms = 5,000 grams. • Explore, record, and look for patterns when doing conversions in a two column table. • Add, subtract, and multiply whole numbers to solve metric measurement situations involving distances, liquid volumes, and masses of objects. Money • Use models to illustrate addition and subtraction of money. • Explore and explain the use of a decimal to separate dollars and cents. • Express the answer in decimal notation (Conventionally, the \$ is placed before the numerical amount.) when solving money word problems. • The dollar symbol and the cent symbol are not used simultaneously. Time • Explore using models (number lines, clocks, etc.) to add and subtract intervals of time in hours and minutes.		Estimate mass (grams and kilograms) (practice) Khan Academy Convert to smaller units (sec. min. & hr) (practice) Khan Academy
Module1,2,3,4,5	4.MD.2 Solve real-world problems involving money, time, and metric measurement.	See above	Module 1 Topic E Quiz Module 1 Assessment Module 2 Topic D Quiz Module 2 Assessment Module 3 Topic E Quiz Module 3 Assessment	Telling time word problems (practice) Time Khan Academy Time conversion word problems (practice) Khan Academy
	4MD.2 a. Using models, add and subtract money and express the answer in decimal notation.	See above	Module 5 Topic D Quiz Module 5 Assessment	Convert money word problems (practice) Khan Academy Buying With Change Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Multiple Items, Multiple Prices Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Receipt Change Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets
	4MD.2 b. Using number line diagrams, clocks, or other models, add and subtract intervals of time in hours and	See above	See above	Time differences (practice) Time Khan Academy



	minutes.			
	4MD.2 c. Add, subtract, and multiply whole numbers to solve metric measurement problems involving distances, liquid volumes, and masses of objects.	See above	See above	Metric conversions word problems (practice) Khan Academy
Module 2	4.MD.3 Develop efficient strategies to determine the area and perimeter of rectangles in real-world situations and mathematical problems. For example, given the total area and one side length of a rectangle, solve for the unknown factor, and given two adjacent side lengths of a rectangle, find the perimeter.	Area and Perimeter • The area of a rectangle can be found by multiplying the lengths of adjacent sides (length and width) of the rectangle. • Given an area or a perimeter of a rectangle and one side length, the adjacent side length can be determined. Area and Perimeter • Explore and explain efficient strategies used to determine the perimeter and area of rectangles in real-world and mathematical situations. • Explore finding an unknown side length in a mathematical situation involving area or perimeter.	Module 2 Topic D Quiz Module 2 Assessment	Represent rectangle measurements (practice) Khan Academy Perimeter - Area (Words) Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Quadrilaterals (Area and Perimeter) Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Area & perimeter of rectangles word problems (practice) Khan Academy
Module 4	4.MD.4 Display and interpret data in graphs (picture graphs, bar graphs, and line plots) to solve problems using numbers and operations for this grade.	Picture Graphs • Display and interpret data using real-world problems. • Use units of halves and quarters for data sets in situations where these fractions are appropriate. Bar Graphs • Display and interpret data using real-world problems (including money and metric measures). • Use whole number units for a large variety of data sets. • Use units of halves and quarters for data sets in situations where these fractions are appropriate. Line Plots • Display and interpret data using real-world problems (including money and metric measures). • Use whole number units for a large variety of data sets. • Use units of halves, quarters, tenths, or hundredths for data sets in situations where these fractions are appropriate.	Module 4 Topic E Quiz Module 4 Assessment	Interpret line plots with fraction addition and subtraction (practice) Khan Academy Finding Difference with Fractional Line Plots Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Graph data on line plots (through 1/8 of a unit) (practice) Khan Academy Creating Line Plots with Fractions (2,4,8) Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets
Module 6	4.MD.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.	MD 5-7 • Draw two rays with a common endpoint to form an angle. • Explore circles explaining one-degree as 1/360 of a circle. • Explore and explain what happens as multiple one-degree angles are accumulated with a common vertex to form a larger angle.	Module 6 Topic B Quiz Module 6 Assessment	Benchmark angles (practice) Khan Academy Estimate angle measures (practice) Khan Academy https://www.commoncoresheets.com/angle-estimation/99/download?version=1



		• Identify angles as right, acute, obtuse, or straight. • Explore and explain which angle measures to use when using a protractor. • Measure angles in whole number degrees using a protractor. • Sketch angles of a specified measure using a protractor. • Explore and explain decomposing an angle into parts, e.g., 45 degrees = 15 degrees + 30 degrees. • Use addition and subtraction to solve for unknown angles in real-world and mathematical problems. • Use an equation with a symbol for an unknown angle measure.		Name angles Angle introduction (practice) Khan Academy Angle basics (practice) Plane figures Khan Academy
Module 6	4MD5 a. Understand 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.	See above	Module 6 Topic B Quiz Module 6 Assessment	Angles in circles (practice) Khan Academy
Module 6	4MD5 b. Understand an angle that turns through n one-degree angles is said to have an angle measure of n degrees.	See above	Module 6 Topic B Quiz Module 6 Assessment	Estimate angle measures (practice) Khan Academy
Module 6	4.MD.6 Measure angles in whole number degrees using a protractor. Sketch angles of specified measure.	See above	Module 6 Topic B Quiz Module 6 Assessment	Measure angles (practice) Determining Angles With Protractors Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Finding Angle (Using Protractor) Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Draw angles (practice) Measuring angles Khan Academy Creating Angles Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Angles in circles (practice) Khan Academy 3 ACT TASK For the Win
Module 6	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	• Use benchmark angles to estimate the measure of angles. • They use what is known and the part–total relationship to determine an unknown angle measure when right angles, straight angles, and angles of known measures are	Module 6 Topic C Quiz Module 6 Assessment	Decompose angles (practice) Khan Academy Finding Missing Angle Worksheet Download Free - Distance Learning, worksheets and more:



	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.	decomposed. Students extend the strategy to find the measures of multiple unknown angle measures around a point.		CommonCoreSheets 3 ACT TASK For the Win (see MD6)
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Unit: Geometry

Essential Questions:

Big Idea: Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Big Idea: Identify attributes of polygons including side length and the presence or absence of pairs of parallel sides, pairs of perpendicular sides, and angle types.

Big Idea: Identify and draw lines of symmetry.

Vocabulary:

classify shapes/figures, properties, point, line, line segment, ray, angle, vertex/vertices, right angle, acute, obtuse, perpendicular, parallel, right triangle, isosceles triangle, equilateral triangle, scalene triangle, line of symmetry, symmetric figures, two dimensional, regular, and irregular

Suggested Pacing	Content Standards	Learning and Performance Expectations What must students know and be able to do?	Assessment of Learning Options How will we know if they learned this skill?	Resources Options
Module 6	4.G.1 Draw points, lines, line segments, rays, angles (right, acute, and obtuse), and perpendicular and parallel lines. Identify these in two dimensional figures.	• Draw points, lines, line segments, rays, and perpendicular and parallel lines. • Identify points, lines, line segments, rays, and perpendicular and parallel lines. • Identify points, line segments, and perpendicular and parallel line segments in two-dimensional figures. • Draw angles (right, acute, and obtuse). • Identify angles (right, acute, and obtuse). • Identify angles (right, acute, and obtuse) in two-dimensional figures. • Draw a shape based on properties of angles, number of sides, or parallel and/or perpendicular sides. • Use correct language when discussing points, lines, line segments, rays, and angles. • Classify two dimensional figures based on the following: • presence or absence of acute, right, and/or obtuse angles. • presence or absence of parallel and/or perpendicular sides; and/or presence or absence of symmetry.	Module 6 Topic A Quiz Module 6 Topic B Quiz Module 6 Topic D Quiz Module 6 Assessment	Identify points, lines, line segments, rays, and angles (practice) Khan Academy Angle types (practice) Plane figures Khan Academy Determining 90 Angle Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Benchmark angles (practice) Khan Academy Determining Visually Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Draw parallel and perpendicular lines (practice) Khan Academy Recognize angles in figures (practice) Khan Academy Determining Angles in Shapes Worksheet Download Free - Distance Learning, worksheets and more: CommonCoreSheets Types of angles by measure (practice) Khan



				Academy Identify parallel and perpendicular lines (practice) Khan Academy https://www.commoncoresheets.com/perpendicular-parallel-intersecting/587/download?version=1
Module 6	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.	See above	Module 6 Topic D Quiz Module 6 Assessment	Quadrilateral types (practice) Khan Academy Classify triangles by angles (practice) Khan Academy https://www.commoncoresheets.com/identifying-right-triangles/844/download?version=1 Classify triangles by both sides and angles (practice) Khan Academy Classify triangles by side lengths (practice) Khan Academy Identify parallel and perpendicular lines (practice) Khan Academy
Module 6	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.	See above	Module 6 Topic D Quiz Module 6 Assessment Ohio Readiness Assessment: Mathematics Checkpoint:Grade 4 Geometry	Intro. to reflective symmetry Identifying Symmetrical Figures Identifying Line Symmetry Symmetry Review