

LCCS 4th Grade Math Curriculum Overview

Month	Unit
September	Unit 1: Math Is..
September	Unit 2: Generalize Place-Value Structure
October	Unit 3: Addition and Subtraction Strategies and Algorithms
November	Unit 4: Multiplication as Comparison
December	Unit 5: Numbers and Number Patterns
January	Unit 6: Multiplication Strategies with Multi-Digit Numbers
January	Unit 7: Division Strategies with Multi-Digit Dividends and 1-Digit Divisors
January	Unit 8: Fraction Equivalence
February	Unit 9: Addition and Subtraction Meanings and Strategies with Fractions
March	Unit 10: Addition and Subtraction Strategies with Mixed Numbers
April	Unit 11: Multiply Fractions by Whole Numbers
May	Unit 12: Decimal Fractions
May	Unit 13: Units of Measurement and Data
June	Unit 14: Geometric Figures

Unit 1: Math Is..

At a Glance:

The focus of this unit is threefold:

- to build students' agency as doers of mathematics. It is important that students understand that math is not just something done in school. Math is part of our daily lives and shows up in almost every activity. It is also important that students see themselves as skilled doers of math, so helping them understand that doing math is not just carrying out operations or calculations. Rather, doing math is more accurately making sense of and solving problems and finding patterns and relationships among quantities and numbers. Lesson 1-1 helps students see themselves as doers of math as they examine their attitudes towards math and their images of themselves as doers of math.
- to build students' proficiency with the habits of mind that are integral to doing mathematics. These include the thinking captured by the practice and process standards found in many state standards for mathematics: that is, the thinking that makes up the problem-solving process and that is involved in finding patterns and relationships among quantities and values. Lessons 1-2 through 1-5 focus on helping students build proficiency with these habits of mind.
- to build understanding of the norms of interaction that allow for a productive math learning environment where students can develop, refine, and enhance the habits of mind that are integral to doing math. Lesson 1-6 offers the opportunity for students to develop together the classroom norms for math for the school year.

Timeline:

10 Days

Unit 2: Generalize Place -Value Structure

At a Glance:

In this unit, students extend their understanding of the base-ten place-value structure to multi-digit numbers within one million. They analyze the relationship between the value of digits in consecutive positions in 3-digit numbers and then look to generalize that relationship to 4- and 5-digit numbers. They explore that just as 100 is 10 times 10 and 1,000 is 10 times 100, a digit in any place in a number has 10 times the value of the same digit in the place to the right.

Students explore the three-position periods that define our base-ten number system and explain the names of different positions within one million and the values of digits in them.

Students extend their understanding of place value and number sense concepts learned in previous grades. These include:

- **Represent numbers in different forms:** Students read and write up to 6-digit numbers in standard, expanded, and word forms.
- **Compare multi-digit numbers:** Students compare up to two 6-digit numbers.
- **Round multi-digit numbers:** Students round multi-digit numbers to an appropriate place based on the purpose of the estimated value.

Timeline:

8 Days

Unit 3: Addition and Subtraction Strategies and Algorithms

At a Glance:

In this unit, students will estimate sums, making use of strategies such as rounding, front-end estimation, and compatible numbers while building on their understanding on the uses and reasonableness of estimation.

Students will also extend strategies they previously learned for adding and subtracting up to 3-digit numbers to adding and subtracting up to 6-digit numbers.

Students will become fluent with adding and subtracting using vertical algorithms, commonly referred to as standard algorithms.

Addition and subtraction strategies include:

- **Add using partial sums:** Students align addends vertically by place value and record each partial sum. They then add the partial sums.
- **Add using adjusting:** Students adjust addends to create compatible numbers, which can be added more easily.
- **Add using an addition algorithm:** Students align addends vertically and add digits in each place. They record and regroup values as needed.
- **Subtract using decomposition:** Students subtract by decomposing the subtrahend, and then subtracting each value from the minuend.
- **Subtract using adjusting:** Students adjust numbers to create compatible numbers, which can be subtracted more easily.
- **Subtract using a subtraction algorithm:** Students align the subtrahend and minuend vertically and subtract digits in each place. They record regroup values as needed.

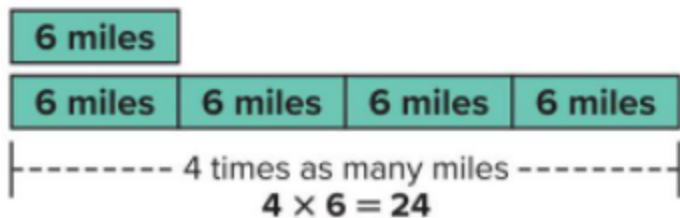
Timeline:

15 Days

Unit 4: Multiplication as Comparison

At a Glance:

Students use multiplication and division to translate phrases such as times as many and times as much to find the total or unknown factors in problems. They recognize that these kinds of phrases are associated with multiplicative comparisons. One commonly used representation for such comparisons is a bar diagram.



Students will further understand that this and other representations of multiplicative comparison can also be used for division.

They understand this because of the relationship between multiplication and division. In solving multiplicative comparison problems, students use this relationship to write and solve multiplication and division equations with the unknown in any position.

Strictly speaking, the phrases "times as great as" and "times greater than" do not mean the same thing. For example, the number 30 is 5 times as great as 6. However, 36 is 5 times greater than 6. This is because "5 times greater than 6" means the answer must be 5×6 , or 30, greater than 6. The equation, $6 + 30 = 36$, shows that 36 is 30 greater than 6.

Despite the formal distinction, popular media frequently use "times greater than" to mean the same thing as "times as great as." Make sure students are aware of and capable of working with this usage.

Timeline:

8 Days

Unit 5: Number and Number Patterns

At a Glance:

In this unit, students will use their understanding of multiplication to decompose a number into factor pairs. They use a systematic approach to find all factor pairs of a whole number. They recognize that factor pairs of a number can be used to classify a number as prime or composite. They explore the relationship between factors and multiples and use this relationship to determine multiples of a given number.

Students examine shape and number patterns and write pattern rules to describe the patterns. They recognize that patterns behave in different ways and understand how the pattern rule dictates what a pattern looks like. Students use pattern rules to extend and generate a sequence of numbers or shapes. They will use their understanding of factors, multiples, and arithmetic patterns to analyze patterns and explain features of the pattern that are not clearly stated in the pattern rule.

Students will extend their understanding of multiplication, division, and arithmetic patterns learned in previous grades. These include:

- **Find Factor Pairs and Multiples:** Students find factor pairs and multiples and understand the relationship between factors and multiples.

- **Identify Prime and Composite Numbers:** Students use understanding of factor pairs to identify prime and composite numbers.
- **Describe, Extend, and Analyze Patterns:** Students use a pattern rule to describe and extend a number or shape pattern. They also identify features of the pattern not explicitly stated in the rule.

Timeline:

10 Days

Unit 6: Multiplication Strategies with Multi-Digit Numbers

At a Glance:

In this unit, students will use multiplication strategies to multiply multi-digit numbers. They will apply decomposition of numbers and the Distributive Property of Multiplication to create area models and find partial products used to calculate a product. Actual products will be compared to estimated products to determine whether or not the solution is reasonable. Students will also use an understanding of place value, properties of operations, and decomposition of factors to multiply multiples of 10.

Finally, students will apply what they have learned to solve multi-step word problems involving multiplication of multi-digit factors.

There are examples of multiplication of multi-digit numbers all around the world. For example, multiplication of multi-digit numbers may be used when finding a total cost for a certain number of items. Encourage students to identify real-world problems that involve multiplication of multi-digit numbers, represent the problem using an equation, and solve.

Timeline:

14 days

Unit 7: Division Strategies with Multi-Digit Dividends and 1-Digit Divisors

At a Glance:

In this unit, students will use their understanding to find whole number quotients and remainders with up to 4-digit dividends and 1-digit divisors. Students will extend their understanding of using compatible numbers to estimate products to using compatible numbers to estimate quotients. Students will also apply prior understandings of using partial products and area models to find products of multi-digit numbers to using area models and partial quotients to divide with multi-digit numbers.

Students will begin the unit by using different strategies to divide multiples of 10, 100, and 1,000 by 1-digit divisors. At the end of the unit, students will interpret remainders in the context of a given problem and solve multi-step problems involving quotients and remainders.

Students will extend their ability to fluently multiply and divide within 100 learned in previous grades. These include:

- **Divide Multiples of 10, 100, and 1,000:** Students use basic facts, the relationship between multiplication and division, place value, and number patterns to divide multiples of 10, 100, and 1-digit divisors.
- **Estimate Quotients:** Students use compatible numbers and ranges to estimate quotients to divide multi-digit dividends by 1-digit divisors.
- **Divide Multi-Digit Dividends by 1-Digit Divisors:** Students use partial quotients and area models to divide multi-digit dividends by 1-digit divisors.
- **Interpret Remainders:** Students interpret remainders in the context of a problem.
- **Solve Multi-Step Problems:** Students will solve multi-step word problems involving division.

Timeline:

14 Days

Unit 8: Fraction Equivalence

At a Glance:

In this unit, students use visual representations to recognize equivalent fractions, noticing the relationship between the number of the parts in the whole and the number of parts that represent each fraction. They connect this relationship to the numerical process of multiplying or dividing a fraction by the same non-zero whole number to generate an equivalent fraction.

Students work with a few strategies for comparing fractions. They might use the benchmark numbers 0, $\frac{1}{2}$, or 1 to decide how the fractions compare to each other. Students can also generate equivalent fractions for one or both fractions so that the fractions have the same numerator or the same denominator.

Students will extend their understanding of fraction equivalence and comparison strategies learned in previous grades. These include:

- **Recognize and Generate Equivalent Fractions:** Students explain the numerical process of multiplying or dividing to generate an equivalent fraction using visual representations. They use this numerical process to recognize and generate equivalent fractions.
- **Comparing Fractions:** Students compare fractions with different numerators and different denominators.

Timeline:

9 Days

Unit 9: Addition and Subtraction Meanings and Strategies with Fractions

At a Glance:

In this unit, students work with unit fractions to create and take apart non-unit fractions. They will determine that like denominators are needed to compose and decompose fractions.

To add or subtract fractions, students need a strong understanding of the terms numerator and denominator. When students decompose fractions into unit fractions, and then add or subtract the unit fractions, they apply the meanings of numerator and denominator.

Students will utilize number lines and fraction models to compose and decompose fractions. It is important for students to have a strong conceptual understanding that the denominators must be the same in order to add or subtract fractions. To help students gain fluency with this concept, fraction tiles and number lines are efficient tools to help students understand that it only makes sense to add or subtract fractions if they have like denominators.

Students will extend their understanding of representing fractions, composing and decomposing numbers learned in previous units and grades to adding and subtracting fractions. These include:

- **Fractions:** Students gained an understanding of fractions, which are formed when a whole is partitioned into equal parts.
- **Represent Numbers in Different Form:** Students compose and decompose fractions to add and subtract.

Timeline:
10 Days

Unit 10: Addition and Subtraction Strategies with Mixed Numbers

At a Glance:

In this unit, students are introduced to mixed numbers as numbers that have a whole-number part and a fraction part. They use this understanding to decompose a mixed number into a sum of whole numbers and/or fractions in different ways. They extend the idea that a fraction can be written as the sum of unit fractions to the idea that a mixed number can be written as the sum of fractions.

Students extend their work with adding and subtracting fractions with like denominators to adding and subtracting mixed numbers with like denominators. They use representations to make sense of different addition and subtraction strategies. These strategies include decomposing one or both mixed numbers and writing the mixed numbers as fractions greater than 1 to add or subtract.

Students extend their understanding of fractions learned in previous grades. This understanding includes:

- **Fractions:** Students gained an understanding of fractions that are formed when a whole is partitioned into equal parts.
- **Representing Fractions:** Students represented fractions using number lines and models.

- **Equivalent Fractions:** Students expressed whole numbers as fractions.

Timeline:

10 Days

Unit 11: Multiply Fractions by Whole Number

At a Glance:

In this unit, students apply what they learned in Grade 3 and earlier in Grade 4 about composing fractions, together with their understanding of multiplication, to multiply fractions and mixed numbers by whole numbers. Students begin by representing multiplication of a fraction by a whole number as repeated addition in the same way they represented multiplication with whole numbers. They see that multiplication of one factor by a whole number involves combining that number of copies of the factor. They represent this using visual fraction models and number lines. Then they symbolically represent the multiplication of any fraction by a whole number.

Students will extend their ability to add and subtract fractions and compare fractions. These include:

- **Multiply a Unit Fraction by a Whole Number:** Students use fraction models to represent a fraction as a multiple of a unit fraction.
- **Multiply a Fraction by a Whole Number:** Students use visual fraction models to multiply a fraction by a whole number.
- **Understand Multiplication of a Fraction by a Whole Number:** Students use their understanding of fractions as multiples of unit fractions to multiply a fraction by a whole number.
- **Multiply a Mixed Number by a Whole Number:** Students use different strategies to multiply mixed numbers by whole numbers.
- **Solve Problems Involving Fractions and Mixed Numbers:** Students solve word problems involving the multiplication of fractions and mixed numbers by whole numbers.

Timeline:

9 Days

Unit 12: Decimal Fractions

At a Glance:

In this unit, students use decimal grids, number lines, and coins to model fractions with denominators of 10 and 100. They use models to help generate equivalent fractions with denominators of 10 and 100 and to add two fractions with unlike denominators of 10 and 100. Students apply their understanding of decimal fractions to write a fraction with a denominator of 10 or 100 as a decimal and vice versa. Students also locate decimals on a number line and use models and place value to compare decimals. Students apply the representation and comparison of decimal

fractions to solve word problems involving money.

Students will extend their ability to add and subtract fractions and compare fractions. These include:

- **Understand Tenths and Hundredths:** Students use fraction models to represent fractions with denominators of 10 and 100.
- **Understand Decimal Notation:** Students use place-value reasoning to understand decimal notation.
- **Compare Decimals:** Students use representations, such as decimal grids and number lines, to compare two decimals.
- **Adding Decimals:** Students use equivalent fractions to add decimals with denominators of 10 and 100.
- **Solve Problems Involving Decimal Fractions:** Students solve word problems involving decimal fractions using dollars, dimes, and pennies.

Timeline:

9 Days

Unit 13: Units of Measurement and Data

At a Glance:

In this unit, students extend their earlier work with metric units of length, liquid volume, and mass to work with relative sizes of units and to perform conversions within the metric system. Students learn that using base units helps them comprehend relative sizes of measurements expressed in larger or smaller units. Students learn that a larger metric unit can be converted to a smaller metric unit by using multiplication.

After working with metric units, students use a similar approach to learn about customary units. Students convert using units of time.

Students extend their knowledge of area, perimeter, and line plots that show fractional measurements.

Students will extend their ability to work with units of measurement and data. These include:

- **Relate Metric and Customary Units:** Students use place value understanding to relate metric units and equivalence tables to relate customary units.
- **Convert Units of Time:** Students use equivalence tables to convert units of time.
- **Create and Interpret Line Plots:** Students create line plots and use them to solve problems involving the addition and subtraction of fractional measurements.

Timeline:

17 Days

Unit 14: Geometric Figures

At a Glance:

In this unit, students build on and formalize their understanding of shapes as they learn to define and name the building blocks of geometric figures, describe and classify shapes in more complex ways, and apply geometric concepts and properties to solve problems.

Students work and build on a framework of founding geometric concepts and skills by addressing the following objectives:

- **Understand Points, Lines, Line Segments, and Rays:** Students identify and draw points, lines, line segments, and rays.
- **Classify Angles:** Students classify angles as right, acute, or obtuse.
- **Draw and Measure Angles:** Students use a protractor to measure angles and draw angles of a specified measure.
- **Understand Parallel and Perpendicular Lines:** Students apply angle concepts to recognize parallel and perpendicular lines.
- **Add and Subtract Angle Measures:** Students use equations to find unknown angle measures. Students apply this understanding to solve problems involving unknown angle measures.
- **Classify Polygons:** Students use properties of shapes to classify polygons, including triangles and quadrilaterals.
- **Understand and Draw Lines of Symmetry:** Students develop an understanding of lines of symmetry and apply this understanding to draw lines of symmetry on 2-dimensional shapes.

Timeline:

16 Days