

## LCCS 3rd Grade Math Curriculum Overview

Month	Unit
September	Unit 1: Math Is..
September	Unit 2: Use Place Value to Fluently Add and Subtract within 1,000
October	Unit 3: Multiplication and Division
November	Unit 4: Use Patterns to Multiply by 0,1,2,5, and 10
December	Unit 5: Use Properties to Multiply by 3,4,6,7,8 and 9
January	Unit 6: Connect to Area and Multiplication
January	Unit 7: Fractions
February	Unit 8: Fractions Equivalence and Comparison
March	Unit 9: Use Multiplication to Divide
April	Unit 10: Use Properties and Strategies to Multiply and Divide
May	Unit 11: Perimeter
May	Unit 12: Measurement and Data
June	Unit 13: Describe and Analyze 2-Dimensional Shapes

### 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 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: Use Place Value to Fluently Add and Subtract within 1,000

**At a Glance:**

In this unit, students extend their knowledge of place value to 3- and 4-digit numbers and apply this knowledge to adding and subtracting 3-digit numbers. Students use place value to form estimates of sums and differences by rounding and using compatible numbers. They will extend their understanding of addition properties by discovering the order or grouping of three addends does not change the sum. Students also identify even and odd addition patterns to help check whether a sum is accurate.

Students use their understanding of place value to learn strategies, such as decomposing and adjusting, and then apply these strategies to help add and subtract more fluently. They also use their understanding of addition and subtraction to solve two-step word problems.

Students will extend their understanding of place value, addition, and subtraction learned in previous grades. These include:

- **Place value:** Students represent 3- and 4-digit number using standard form, expanded form, and word form.
- **Round multi-digit numbers:** Students round multi-digit numbers to the nearest 10 and nearest 100.
- **Addition:** Students use addition properties and strategies to add 3-digit numbers.
- **Subtraction:** Students use strategies to subtract 3-digit numbers.

**Timeline:**

18 Days

## Unit 3: Multiplication and Division

**At a Glance:**

In this unit, students use a variety of representations to show multiplication and division situations. Visual representations of equal groups lay the foundation for multiplication and division. Real-life objects are used first, with students moving to representing multiplication and division with manipulatives, and then with numbers and symbols.

By the end of this unit, students should recognize whether a problem should be thought of as a multiplication or a division situation depending on how it is written. They also recognize that multiplication and division relate to each other because they represent the same number of objects and the same number of groups.

Students extend their understanding of addition and equal-group concepts learned in previous grades. These include:

- **Repeated addition:** Students use equal groups to find the product in multiplication equations.
- **Arrays:** Students use arrays to represent equal groups and can help solve multiplication and division equations.

**Timeline:**

12 Days

### Unit 4: Use Patterns to Multiply by 0, 1, 2, 5, and 10

**At a Glance:**

**Patterns**

Starting in Grade 3, students begin to delve into a variety of multiplication problems. In the previous unit, students were introduced to multiplication and division representations.

In this unit, students discover patterns in products involving the numbers 0, 1, 2, 5, and 10. Products of 2 have 0, 2, 4, 6, or 8 in the ones place. Products of 5 have either a 5 or 0 in the ones place. Products of 10 have a 0 in the ones place. When multiplying by 1, the product is the same as the other factor, and when a number is multiplied by 0, the product is always 0. Knowing about patterns can help students determine whether a product is reasonable or accurate.

**Multiplication Representations**

Students use varying methods and representations to remember multiplication with the factors 2, 5, and 10. They relate multiplying by 2 as doubling or twice as much. They also refer to 10s that they have previously learned about equal groups and repeated addition. In order to connect multiplication to addition, doubling can be thought of as adding two equal groups. To multiply by 5, students use arrays with rows of 5. Students also skip count to multiply by 10. A multiplication fact table is also used to find patterns in the products that can help students recall multiplication

facts.

**Timeline:**

10 Days

**Unit 5: Properties to Multiply by 3,4,6,7,8, and 9**

**At a Glance:**

As students progress through Grade 3, they learn more strategies to solve multiplication problems. One multiplication strategy that this unit emphasizes is doubling. Students learn that when a factor doubles, the product also doubles.

Students are first introduced to the doubling strategy when relating products of 2s to products of 4s using the Multiplication Fact Table and patterns from previous equations. Students know that 2 is half of 4, which means 4 is double 2. This is when they discover they can double products of 2s to find the products of 4s. Students learn that they can double a 2s product to find a 4s product by using representations. They conclude that when a factor doubles, the products also doubles.

Similarly the factor 6 is double 3, so a 3s product can be doubled to get a 6s product for the same other factor. Then, arrays are used to represent the doubling of products of 4s to get products of 8s. Students can visually see how the dimensions of two  $4 \times 5$  arrays equal one  $8 \times 5$  array.

To find the unknown 3s facts, students can also use the known 2s facts and then add one more group. For example, they can combine the products of 2 groups of 4 and 1 group of 4 to make 3 groups of 4.

The same methods are used to multiply by 6 as students learn to decompose the factor of 6 into 5 and 1, which means  $6 \times 7 = (5 \times 7) + (1 \times 7)$ .

**Timeline:**

12 Days

**Unit 6: Connect Area and Multiplication**

**At a Glance:**

**Developing the Concept of Area**

Students begin to explore different ways to use their multiplication skills. In this unit, students discover strategies for finding the area of rectangles and composite rectilinear figures. They are first introduced to the concept of finding area of a 2-dimensional figure by covering it with unit squares without gaps or overlaps and counting the number of unit squares, a process known as tiling.

Students find the area of a figure by identifying the number of rows and columns of unit squares it takes to tile it completely. They then represent the situation with a multiplication equation. This process leads students to make explicit connections between counting units of area with counting and multiplication. Rather than counting individual square units or skip counting by rows or columns, students discover that they can multiply the number of columns by the number of rows to find the area of a rectangle.

### **Finding Area by Decomposing Figures**

Students then apply the Distributive Property as they discover that they can decompose a larger rectangle into two smaller rectangles, and that the area of the large rectangle is the sum of the areas of the smaller rectangles. This understanding is extended to the area of composite figures, where students decompose a rectilinear figure into rectangles, find the area of each of the rectangles, and then add them to find the total area of the composite figure.

Finally, students apply their understanding of area to find the area of figures in real-world situations.

#### **Timeline:**

11 days

## **Unit 7: Fractions**

### **At a Glance:**

#### **Fractions, Unit Fractions, and Fractions Equal to or Greater Than One**

Starting in Grade 3, students begin to explore fractions. They experiment with different ways to partition a whole into equal parts with equal areas. Students divide a 2-dimensional shape into equal parts and learn that they can use a fraction to represent one or more of those parts. The denominator is the bottom number in the fraction, and it represents the total number of equal parts in the whole. The numerator is the top number in the fraction, and it represents the number of equal parts being discussed. Students learn that the interval between two whole numbers on a number line represents one whole. They can partition the interval into equal parts. Each equal part can be represented using a unit fraction.

Students learn that a unit fraction has a numerator of one. Iterations of unit fractions can be used to write a fraction that represents more than one part of a whole.

Whole numbers can also be represented as fractions. Fraction tiles, fraction circles, shapes, and number lines can be used to model, and skip counting, repeated addition, and multiplication can be used to determine how to write whole numbers. When a fraction is equal to a whole number, the numerator is the product of the denominator and the whole number.

#### **Timeline:**

10 Days

## Unit 8: Fraction Equivalence and Comparison

### At a Glance:

#### Fractions That Can Be Compared and Equivalent Fractions

In this unit, students continue their study of fractions as they develop strategies for comparing two fractions. They learn that fractions can only be compared when they come from wholes of the same size. When they refer to different-sized wholes, the lesser fraction, in reference to a larger whole, might actually refer to a greater quantity. This idea helps students learn about equivalent fractions. Two or more fractions that represent the same amount of the same-size whole are equivalent fractions. Representations such as pizzas, circles, rectangles, and fraction models all help students to visually understand how two fractions can be equivalent.

Two or more fractions are also equivalent if they represent the same point on a number line when the wholes are the same length. This means the distance from 0 to 1 on each number line is the same for the fractions being compared.

Another way to determine whether fractions are equivalent is to use fraction tiles. These show two fractions are equivalent when they represent the same amount of the same-size whole.

Fractions with the same denominator can be compared by comparing their numerators. Because the denominators are the same, the size of the parts is the same. Students conclude that when the denominators are the same, the greater the numerator, the greater the fraction.

The greater the number of parts in a whole, the smaller the size of each part. So, when two fractions have the same numerator, the one with the greater denominator has the smaller parts, and is, therefore, the lesser fraction. This is because the smaller pieces are being compared to the same number of larger pieces.

### Timeline:

12 Days

## Unit 9: Use Multiplication to Divide

### At a Glance:

Starting in Grade 3, students begin to delve into a variety of multiplication and division problems. Previously, students were introduced to multiplication and division representations. In this unit, students use patterns and the relationship between multiplication and division to help determine whether a quotient is reasonable or accurate.

Students will discover patterns when dividing by 1. When multiplying by 1, the product is the same as the other factor. So when dividing a number by itself, the quotient is 1. When dividing by 1, the quotient is the same as the dividend.

Students will also discover patterns when dividing using 0. When a number is multiplied by 0, the product is always 0. When 0 is divided by a non-zero number, the quotient is always 0. A non-zero number can never be divided by 0 because there is no number that can be multiplied by 0 to equal that number.

Equal groups are helpful to students both when multiplying and dividing. Arrays can be used to help students visualize these equal groups. Pennies can be placed into arrays to help with dividing by 5 and 10. Students should also be aware that multiplication and division are related operations. For example, the multiplication equation  $2 \times 10 = 20$  can be thought of as 2 groups of 10 equals 20. Students can use this equation to find  $20 \div 2$ . Students can also use multiplication facts to remember related division facts. The related multiplication and division equations can be represented by the same array.

**Timeline:**

15 Days

## Unit 10: Use Properties and Strategies to Multiply and Divide

**At a Glance:**

### **Multiplication Patterns and Two-Step Word Problems**

As students progress through this unit, they use their previous knowledge of patterns to lay the foundation for their work with identifying multiplication patterns. Students learn about how place value, patterns, and properties can be used to help multiply. Students discover that when multiplying with three or more factors, they can group the factors in any order and the product will be the same.

Students can use previously-learned place-value concepts to help them multiply larger numbers. Students write an equation to determine the number of cards there are in an album:  $8 \text{ cards per page} \times 60 \text{ pages} = ?$  Because 60 is a multiple of 10 and  $8 \times 6 = 48$  is a basic fact, students are encouraged to think about the problem as  $8 \times 6$  tens. Students place a zero in the ones column as a placeholder and shift the other numbers left to get the product of 480.

Students discover how to solve two-step word problems involving multiplication and division, using representations and equations to solve the problem. Then they progress to solving two-step word problems that involve any of the four operations. Students solve one equation at a time and use a letter to represent the unknown in each equation, even when the problem includes more than just multiplication and division.

Finally, students determine whether an answer is reasonable. They learn that mental math and estimation strategies can be used to find an approximate answer. If the given answer is close to their approximation, then the answer is reasonable.

**Timeline:**  
10 Days

### Unit 11: Data Analysis

**At a Glance:**

Starting in Grade 3, students begin to explore different ways to use their addition and multiplication skills. In this unit, students discover strategies for finding the perimeter of figures, including work with composite figures.

Students are introduced to perimeter by finding the distance around a rectangle and then a rectangular garden. The perimeter is the distance around the boundary of a 2-dimensional figure. After finding the perimeter of rectangles, students continue to find the perimeter of irregular and composite figures. Knowledge of perimeter leads students to finding missing, or unknown, side lengths. They write addition equations to represent the perimeter. Then, they find the missing side lengths of figures with known perimeters. One process is to add the known side lengths together, and then subtract the total from the perimeter.

Students explore rectangular rugs to discover that two rectangles can have the same perimeter, but can have different areas. For example, a rug with side lengths of 4 feet and 3 feet has an area of 12 square feet, which is the same as the area of a rug with side lengths of 6 feet and 2 feet. However, the first rug has a perimeter of 14 feet and the second rug has a perimeter of 16 feet. Rectangles can also have the same area with different perimeters. This work reinforces that area and perimeter are measured differently and helps students distinguish perimeter from area.

**Timeline:**  
9 Days

### Unit 12: Perimeter

**At a Glance:**

In this unit, students explore a variety of measurement and data topics while applying skills with the four operations to solve problems related to those topics. Students work with liquid volume and mass, tell time to the minute and determine time intervals, and collect/record data and create/analyze scaled picture and bar graphs. Students also measure to halves and fourths of an inch and show such measurement data on a line plot.

Liquid volume is the amount of liquid in a container. Students estimate and measure liquid volume using the metric units liter (L) and milliliter (mL). For reference, 1 liter is a little more than 1 quart and 1 milliliter is about the size of 20 drops from an eyedropper. Through hands-on experiences, students establish benchmarks for liquid volume that they should be able to use in the real world. They also compare volume and learn that different shaped containers may have the same volume.

Students estimate and measure mass using the metric units gram (g) and kilogram (kg). Mass is a measure of how much matter is in an object. Students use the mass of one object to estimate whether another object is greater or less than 1 gram or 1 kilogram.

Students tell time and determine time intervals to the minute using both an analog clock and a digital clock. Another term for time interval is elapsed time. It is the amount of time that passes from the start of an activity to the end of an activity.

Students also collect, record, and organize data. Students create and analyze scaled picture graphs and scaled bar graphs. A scaled picture graph uses pictures or symbols to represent data where each symbol stands for more than one data point as indicated by the key. A scaled bar graph uses the lengths of bars to represent data where the intervals on the frequency scale are greater than 1. Students also use the graphs to solve one- and two-step "how many more" and "how many less" problems.

**Timeline:**

17 Days

### Unit 13: Describe and Analyze 2-Dimensional Shapes

**At a Glance:**

In this unit, students explore categories and relationships among 2-dimensional shapes and their attributes. An attribute is a characteristic or property of an object. Figures can be labeled with the broad name of polygons. Before students use polygon prefixes to determine the number of sides and angles and how to identify them, students are tasked with identifying whether shapes are polygons. A polygon is a closed 2-dimensional shape formed by three or more sides that do not cross, so shapes with curved lines, lines that cross, or open sides are not polygons.

Students learn that a polygon with four sides is called a quadrilateral. Students label 2-dimensional shapes based on right angles and equal side lengths.

In this unit, students learn that a right angle is an angle that forms a square corner. In Grade 4, however, students will learn about perpendicular lines and 90-degree angles.

Students also discuss attributes that quadrilaterals share. Students learn that different shapes such as squares and rectangles have attributes in common, such as having four sides. These shared attributes can define a larger category: quadrilaterals.

**Timeline:**

8 Days