Grade 4 Math Unit 2

Content Area: **Mathematics**
Course(s):
Time Period: **Trimester 2**
Length: **59 days**
Status: **Published**

Brief Summary of Unit

In this unit, students will use what they know about place value to multiply and divide multi-digit numbers. Students will explore concepts about factors and multiples. Students will also learn that units of measurement can be divided into smaller units. Students will extend that understanding to convert measurements from the larger unit to the smaller unit. Students will apply their understanding of multiplication and division to find the area and perimeter of rectangles.

Towards the end of the unit, students will begin to explore fractions. Students will relate fractions to whole numbers, and use what they know to show build, and take apart fractions to solve problems.

Revision Date: August 2024

Essential Questions/Enduring Understandings

Essential Questions:

- How can we use our understanding of place value to multiply and divide multi-digit numbers?
- How can we use visual models to represent fraction equivalency?
- How can we determine if one fraction is greater than another?
- How can measurement data be displayed on a line plot?
- How can an understanding of operations be used to solve problems in the real world?

Enduring Understandings:

- Multiplication and division have an inverse relationship. The inverse relationship between multiplication and division can be used to find division facts; every division fact has a related multiplication fact.
- Understanding that separating and sharing among equal groups is described as division. Real-world division situations can be solved by repeated subtraction and sharing.
- Understanding basic facts and place value can be used to find quotients using mental math. Substituting and using compatible numbers can efficiently and accurately be used to estimate

quotients. Mentally multiplying by different powers of ten will help you arrive at an estimate for the quotient of a multi-digit division problem.

- Understanding that division with multi-digit dividends can be solved by repeatedly subtracting the divisor from the dividend as many times as possible.
- Equivalent fractions are found by multiplying or dividing the numerator and denominator by the same nonzero number.

Students Will Know/Students Will be Skilled At

Students will know: .

- How to multiply up to 4-digit numbers by a 1-digit number using arrays, area models, and partial products.
- How to multiply a 2-digit number by a 2-digit number using arrays, area models, and partial products.
- How to use strategies to divide up to 4-digit dividends by one-digit divisors and explain the answer using equations, rectangular arrays, area models, and partial quotients.
- How to use multiplication to check if a quotient is correct.
- How to determine if a number between 1 and 100 is a prime or composite number.
- How to find all factor pairs for a whole number up to 100 and determine whether it is a multiple of a given 1-digit whole number.
- How to use formulas to find the area and perimeter of rectangles.
- How to explain, using visual fraction models, why two fractions are equivalent.
- How to generate equivalent fractions, using fraction a/b as equivalent to fraction $(n \times a)/(n \times b)$.
- How to compare two fractions with different numerators and different denominators using >, <, and =, and justify the comparison by using visual fraction models. (recognizing the comparison only valid when two fractions refer to the same whole).
- How to create common denominators in order to compare two fractions.
- How to compare two fractions with different numerators and different denominators by comparing to a benchmark fraction.
- How to record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
- How to decompose a fraction into a sum of fractions with the same denominator in more than one way; record decomposition as an equation and justify it with a visual fraction model.
- How to add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number

with an equivalent fraction greater than 1, or by decomposing fractions.

- How to 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.

Students will be skilled at:

- Multiplying up to a 4-digit number by a single digit, and multiplying a 2-digit number by a 2-digit number.
- Dividing a whole number of up to four-digits by a one-digit divisor; representing and Explaining the calculation using equations, rectangular arrays and area models.
- Writing and solving equations in order to solve multi-step word problems, using a letter to represent the unknown; interpreting remainders in context and assessing the reasonableness of answers using mental computation with estimation strategies.
- Finding all factor pairs for a whole number up to 100 and determining whether it is a multiple of a given 1-digit whole number and whether it is prime or composite.
- Using area and perimeter formulas when solving problems about rectangles.
- Recognizing and generating equivalent fractions and explaining why they are equivalent using visual fraction models.
- Comparing two fractions with different numerators or different denominators, recording the comparison with >, =, <, and justifying the conclusion using visual fraction models.
- Decomposing a fraction into a sum of fractions with the same denominator in more than one way and record the decomposition as an equation; justifying the decomposition with a visual fraction model.
- Adding and subtracting mixed numbers with like denominators by replacing each mixed number with an equivalent fraction or improper fraction.
- Solving word problems involving addition and subtraction of fractions having like denominators using visual fraction models and equations to represent the problem.

Learning Plan

Daily Warm-ups (5-10 minutes):

*As an opening to each math lesson, the instructor can use these different routines

- Number Talks- District Created Resource (Linked Below in Materials)
- Number Bounce- Begin this routine by telling your students that you will count forward or backward by ones starting with a specific number and ending with a specific number. Let your students know

that when you tap them, they will have to say the next number. Here is one example using the start number 213 and the end number 235. Start counting forward by ones like: 213, 214, 215, 216. Next, tap a student on the shoulder. The student says 217. Then continue counting: 218, 219, 220. Tap a different student. The student says 221. Continue to count in this way until I have given most of the students an opportunity to answer. The student who says the last number in the sequence says, "235. Bounce" and gets the opportunity to do a 20-second celebratory dance. This routine also works well for fractions and decimals.

- Base Ten Toss- A beach ball or bean bag is recommended when implementing this routine. Begin this routine by telling your students that they will count in base ten language until they reach a base ten decade with no ones (example: 3 tens 0 ones or 30, 4 tens 0 ones or 40). For this routine, students stand in a circle. After one student counts in base ten language (ex. 7 tens 5 ones…75), he or she passes a beach ball or bean bag to the person standing next to them. When a student says a base ten decade with no ones (ex. 8 tens 0 ones…80), they get the opportunity to toss the beach ball to any classmate of their choice. For example: Count forward starting with 5 tens 9 ones…59. Next person 6 tens 0 ones..60, next person 6 tens 1 one…61, etc. This routine works for larger numbers and decimals as well. Students can add on hundreds (ex. 6 hundreds 9 tens and 8 ones…698) or hundredths (ex. 6 tens 7 ones and 37 hundredths…67.37). For more of a challenge, they can count backward.

- Amazing Race: Students work in pairs to decompose a given number in as many different ways as they can. You should provide each partner pair with a blank piece of paper or this sheet. You can give your students 5 – 10 minutes to record as many different ways to represent the number as possible. After the time is up, 1 or 2 partner pairs can randomly be selected to share what they recorded, in front of the class. This routine can easily be adapted to fractions or decimals. For example, you can write 7/10 or 0.7 as the number of the day. Students get a chance to be as creative as possible when recording. When you first start this routine, your students may only have 2 or 3 different ways. That's OKAY….. If you consistently use this routine, your students will evolve and ultimately fill the page! As a quick tip, you can award team points to partner pairs that had the most inventive and correct ways. It is very important to check for accuracy.

- Number Strings- This routine helps to build students' mental math capabilities. The teacher writes a problem horizontally on the board in a whole group or small setting. The students mentally solve the problem and share with the whole group how they solved it. They must justify and defend their reasoning. The teacher records the students' thinking in an open number line and poses extended questions to draw out deeper understanding for all. The teacher can have students share other students' strategies to the whole group or with turn and talk. Eventually, provide a few number sentences on the board to solve within 20 and multiplication to ten and model how you can use mental math strategies to solve them in a snap just like they would on a fact test. Then, let them try solving in a snap as you point to each number sentence.

1. Fourth graders need to be fluent in multiplying and dividing to twelve. This is a skill that should be worked on throughout the year utilizing the Ready Math Program and supplemental resources that are located under materials.

2. **Multiply One-Digit Numbers-** Instruct students to use arrays of base-ten blocks, area models and partial products to multiply. Guide students to apply their understanding of place value to multiply three and four-digit numbers by one-digit numbers.

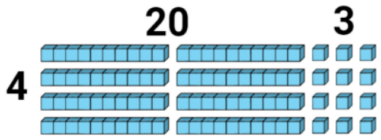
a. Complete Lesson 11, Sessions 1-4 (4 days)

b. Strategies to teach:

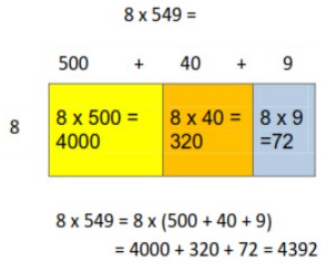
   i. Area model

   ii. Partial products

c. Begin with students seeing multiplication as an array, or area model. This can be done using base ten blocks. Use visual models to show students how to break apart an array into two parts to help them understand partial products.



d. Students can be scaffolded to then use the open area area model.



e. Make a connection between the area model and partial products. Students should see the connection that the "parts" in partial products come from breaking apart an area model

Partial Products		Area Model
324	300 + 20 + 4	x 300 20 4
x 6		6 1,800 120 24
24	6 x 4	1,800 + 120+ 24 = 1,944
120	6 x 20	
1,800	6 x 300	
1,944		

f. Lesson Vocabulary: partial products, estimate, factor, multiple, multiplication, product, reasonable

3. **Multiply by Two-Digit Numbers**- Instruct students to use properties of operations, area models, and partial products to multiply two-digit numbers by two-digit numbers.

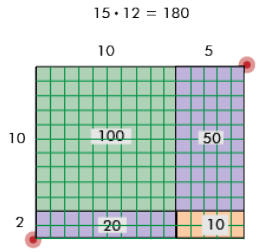
a. Complete Lesson 12, Sessions 1-3 (3 days)

b. Possible strategies include but are not limited to:

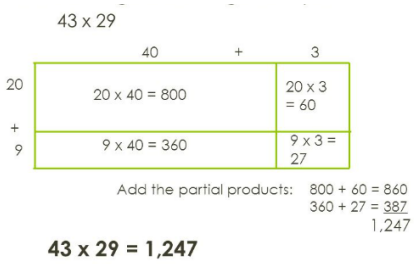
i. Area model

ii. Partial products

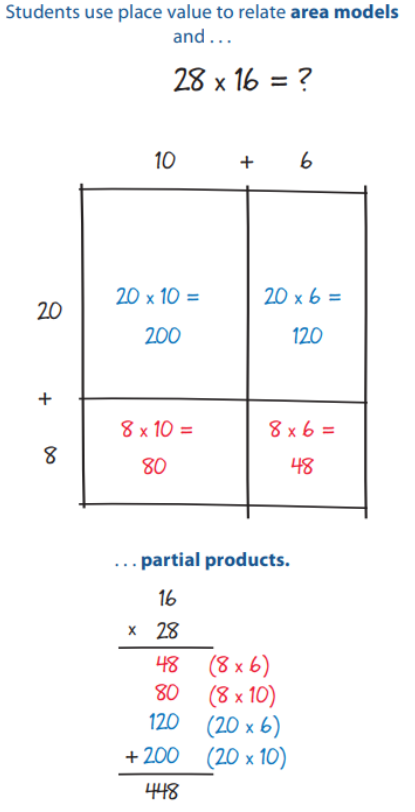
c. Begin by connecting to students' understanding of visual models for multiplying a single-digit factor by a multi-digit factor. Provide students with a lot of visuals to help students make the connection between multiplying by a single digit and by a two-digit factor



d. When students are comfortable, use the open area model to break apart factors:



e. Progress to partial products. To prepare students for the standard algorithm, always have them multiply the bottom digit times the top digit, beginning with the ones, then tens.



f. Lesson Vocabulary: partial products, estimate, factor, multiple, multiplication, product, reasonable

4. **Using Multiplication to Convert Measurements** - Instruct students to express the same relationship between two measurement units using multiplication. For example, an object's length in meters multiplied by 100 gives the length in centimeters. Teach students to use diagrams, tables, and equations to illustrate multiplicative relationships and convert from the larger unit to the smaller one.

a. Complete Lesson 13, Sessions 1-4 (4 days)

b. Possible strategies include but are not limited to:

   i. Drawing models to visually represent the relationship between units of measurement

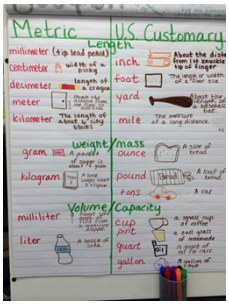
   ii. Using conversion tables to show equivalent measurements within the same system

   iii. Multiplication using partial products or area models

c. Provide students with concrete examples of objects to measure. For example, bring in different sized containers and have students make predictions about how many cups, quarts, pints, etc the container can hold. Likewise, have students practice measuring different classroom objects to build number sense about the relative size of different units of measure.

d. Give students experience using tools to measure objects (rulers, meter stick, tape measure, scales)

e. Create anchor charts of common objects and what they may weigh, or what the capacity is. For example, items that weigh about an ounce, pound, ton, etc.



f. Lesson Vocabulary: convert, customary system, metric system

5. **Divide Three-Digit Numbers-** Guide students to apply their knowledge of basic facts, along with place-value understanding and properties of operations, to solve multi-digit division problems. Students should learn to use rectangular arrays and area models to divide. Instruct students to find quotients with remainder and interpret the remainder in the context of a problem.

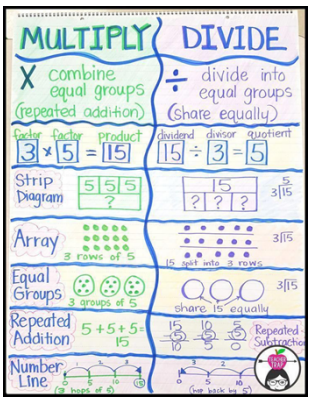
a. Complete Lesson 14, Sessions 1-4 (4 days)

b. Possible strategies include but are not limited to:

   i. Place value

   ii. Area models

c. Create an anchor chart to compare multiplication and division. Make a list of real-world situations where one might need to divide



d. Scaffold learning by connecting back to the area model used for multiplication. Relate division vocabulary to the different parts of an area model.

e. Encourage students to estimate the quotient before solving to determine the reasonableness of their answer. Similarly, students should use multiplication to check their answers.

f. Give students lots of experience using an open area model for division. This can be done by giving a blank area model in a communicator. Or, have students draw open area models on dry erase boards.

g. Focus on solving word problems involving division. Students should engage in discussions about how to interpret the remainder, and how to be sure they answer the question to a word problem. This can also be done as a word problem sort where students discuss what needs to be done with the remainder once the equation has been solved.

h. Lesson Vocabulary: dividend, divisor, divide, division, estimate, multiple, quotient, remainder

6. Divide Four-Digit Numbers - Guide students to apply their knowledge of basic facts, along with place-value understanding and properties of operations, to divide up to four-digit numbers by one-digit numbers. Students should learn to use area models to divide, showing multiplication and repeated subtraction part by

part. Students should also be taught to use a vertical division format to find partial quotients to divide. Instruct students to find quotients with remainder and interpret the remainder in the context of a problem.

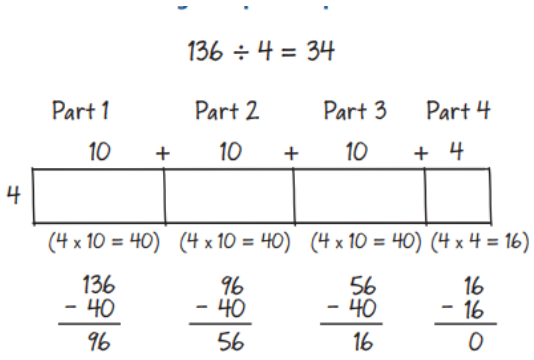
a. Complete Lesson 15, Sessions 1-3 (3 Days)

b. Possible strategies include but are not limited to:

   i. Area models

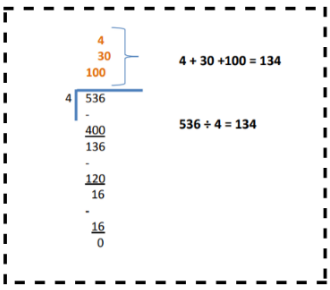
   ii. Partial quotients

c. Extend learning about the area model from Lesson 14 to 4-digit divisors.



d. Provide lots of practice using the open area model, reviewing estimation and using multiplication to check the reasonableness of answers.

e. Like with multiplication, connect the area model to partial quotients so students see how they are both strategies for breaking apart a number.



Step 1: Find the **greatest factor** that can be multiplied to get a product closest to the given dividend.
Step 2: Find the **difference** between the dividend and the product of the divisor.
Step 3: Find the greatest factor that can be multiplied to the divisor to get a product closest to the difference found.
Step 4: Continue to find the partial quotients until the difference is zero or less than the divisor.
Step 5: **Add** the partial quotients to find the quotient.

f. Continue solving word problems involving division. Students should engage in discussions about how to interpret the remainder, and how to be sure they answer the question to a word problem.

g. Lesson Vocabulary: partial quotients, divide, dividend, division, divisor, quotient, remainder

7. **Multiples and Factors**- Guide students to connect their understanding of multiplication to the language of

multiples and factors. Instruct students to use familiar methods and models such as skip-counting, number lines, arrays, and area models to find multiples and factors of a whole number. Students should be taught to see the relationship between multiples and factors as they recognize that a number is a multiple of its factors. Instruct students to start at 1 to systematically find all the factor pairs of a number. They should learn to identify numbers as prime or composite.

a. Complete Lesson 8, Sessions 1-5 (5 Days)

b. Possible strategies include but are not limited to:

   i. Concrete models using counters

   ii. Drawing pictures

   iii. Number lines, skip counting

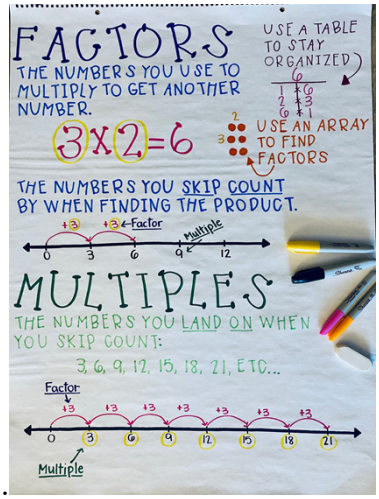
   iv. Arrays/ area models

   v. Factor lists/pairs

c. Start by introducing multiples. Connect to the word "multiply" and how a multiple is found by multiplying two numbers together. Provide a variety of real world situations where finding/using multiples would be necessary.

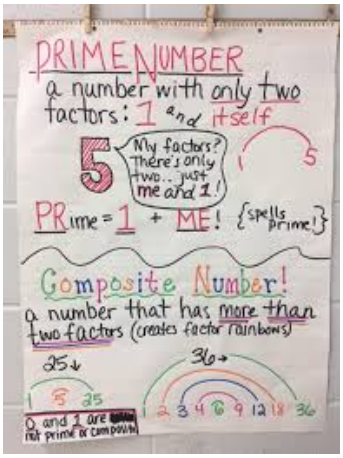
d. To introduce factors, begin by giving students experience making different arrays with concrete models such as counters. They should start to explore the different ways a given number can be arranged into an array. This will help introduce the concept of factor pairs for a given number.

e. Encourage students to use a systematic approach to finding factors to ensure they have found all the factors of a given number.



f. Emphasize the connection between factors and multiples.

g. Have students list factor pairs for a variety of numbers (both prime and composite). Have students discuss what they noticed about the lists created. Guide students to recognize that some of the numbers only have two factors, whereas others have more. This can be used to introduce the vocabulary

"prime" and "composite". 

h. Lesson Vocabulary: composite number, factor pair, factors of a number, multiple, prime number, array, factor, multiplication, multiply

8. Find Perimeter and Area- Students should be taught to build on their previous knowledge of area and perimeter by using models to develop an understanding of the area and perimeter formulas for rectangles. Guide students to apply the formulas and explain why the formulas work. They should also be taught to use their knowledge of multiplication and division to apply the area formula, including solving for an unknown factor.

a. Complete Lesson 16, Sessions 1-4 (4 Days)

b. Possible strategies include but are not limited to:

   i. Using models/diagrams

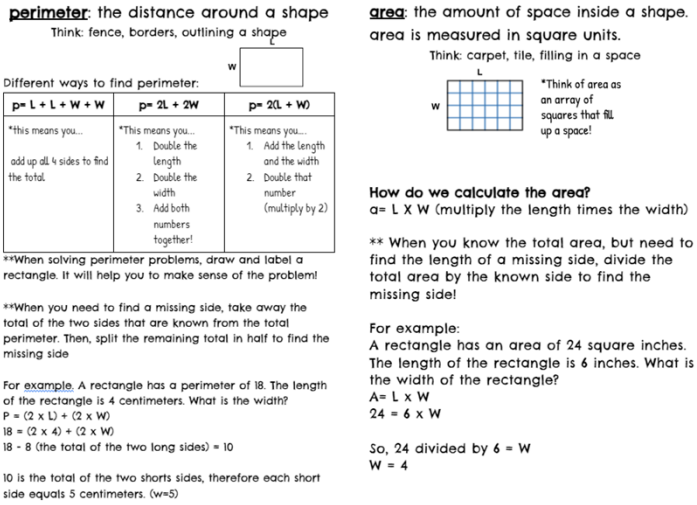
   ii. Area and perimeter formulas

c. To begin, manipulatives can be used to help students understand the difference between area and perimeter. Square tiles can be used to model area and toothpicks can be used to model perimeter.

d. Create a class anchor chart of when we use area and perimeter in the real world to help students build a better understanding of how to decipher between a problem involving area or perimeter.

e. Provide various formulas for finding the perimeter of a shape, but allow students to choose which they like best. This can encourage "math talk" among students as they explain their thinking.

f. Give contextual word problems that vary between finding the total perimeter, or an known side when the perimeter and one side length are given. Likewise, provide word problems involving finding the total area, or a missing side length when the area and one side length are given.



perimeter: the distance around a shape

Think: fence, borders, outlining a shape

L

w

Different ways to find perimeter:

p= L + L + W + W	p= 2L + 2W	p= 2(L + W)
*this means you... add up all 4 sides to find the total.	*This means you... 1. Double the length 2. Double the width 3. Add both numbers together!	*This means you... 1. Add the length and the width 2. Double that number (multiply by 2)

**When solving perimeter problems, draw and label a rectangle. It will help you to make sense of the problem!

**When you need to find a missing side, take away the total of the two sides that are known from the total perimeter. Then, split the remaining total in half to find the missing side

For example. A rectangle has a perimeter of 18. The length of the rectangle is 4 centimeters. What is the width?
P = (2 x L) + (2 x W)
18 = (2 x 4) + (2 x W)
18 - 8 (the total of the two long sides) = 10

10 is the total of the two shorts sides, therefore each short side equals 5 centimeters. (w=5)

area: the amount of space inside a shape.

area is measured in square units.

Think: carpet, tile, filling in a space

L

w

*Think of area as an array of squares that fill up a space!

How do we calculate the area?
a= L X W (multiply the length times the width)

** When you know the total area, but need to find the length of a missing side, divide the total area by the known side to find the missing side!

For example:
A rectangle has an area of 24 square inches. The length of the rectangle is 6 inches. What is the width of the rectangle?
A= L x W
24 = 6 x W

So, 24 divided by 6 = W
W = 4

g. Lesson Vocabulary: formula, area, perimeter

9. **Understand Equivalent Fractions**- Students should be taught that a whole can be divided in different ways to find equivalent fractions. Guide students to relate this work with visual models to a conceptual understanding of fraction equivalency. Students should be taught that multiplying the numerator and denominator of a fraction by the same whole number results in an equivalent fraction.

a. Complete Lesson 17, Sessions 1-3 (3 Days)

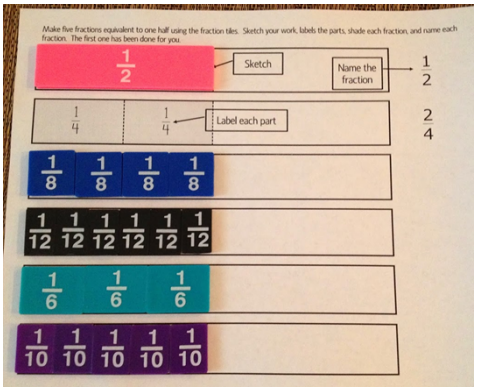
b. Possible strategies include but are not limited to:

i. Area models

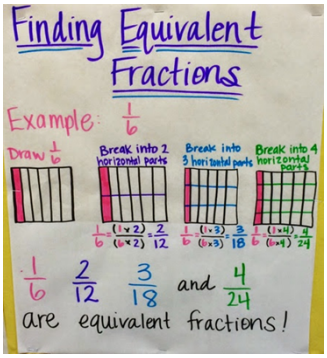
ii. Number lines

iii. multiplication and division

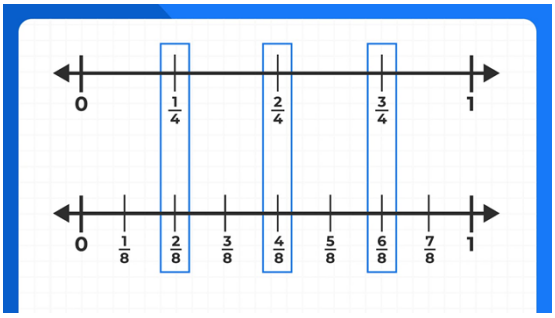
c. Students can use manipulatives, such as fraction bars, to explore the concept of fraction equivalency. They can build pairs of equivalent fractions and start to notice patterns, or make observations.



d. Students should have ample practice dividing a whole into different parts to represent equivalent fractions. This can be done by providing open area models in a communicator.



e. Students should also have experience partitioning number lines to identify equivalent fractions.



f. Help students discover using multiplication and division to find equivalent fractions by having them first use the visual models, then ask guiding questions to help them see the relationship between the numerator and the denominator. Help students understand the "why" behind this. For example, begin with the fraction ⅓. If you multiply the denominator by 4, you have made 4 times as many parts in the whole. Therefore, you need 4 times as many pieces being described by the numerator in order for the fraction to be equivalent. Therefore, you must also multiply the numerator by 4.

g. Lesson Vocabulary: denominator, equivalent fractions, fraction, numerator, unit fraction

10. **Compare Fractions**- Guide students to extend their understanding of fractions to compare two fractions with different numerators and different denominators. Instruct students to use models to compare fractions by using common numerators or denominators. Students should also be instructed to use benchmark fractions to compare fractions. They should be taught to record comparisons using >,< and =.

a. Complete lesson 18, Sessions 1-4 (4 Days)

b. Possible strategies include but are not limited to:

   i. Area models

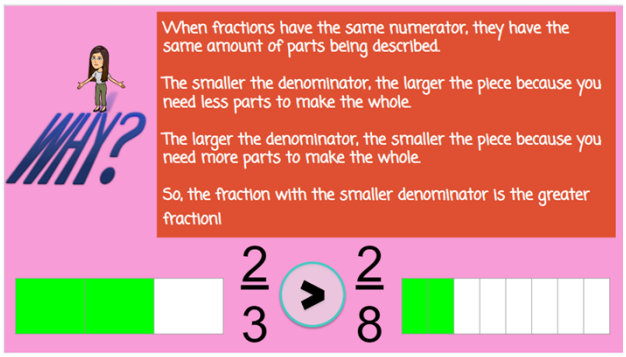
   ii. Number lines/benchmark fractions

   iii. Creating common denominators

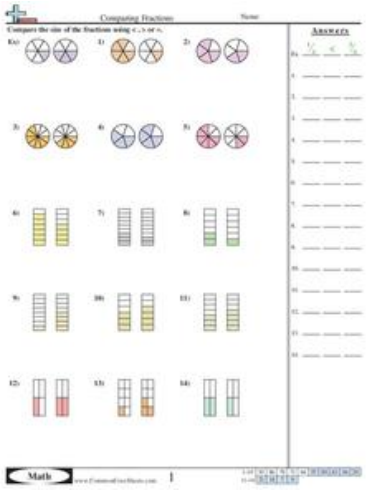
c. Build fraction number sense by first discussing unit fractions, and what happens to a fraction as the denominator increases. Help students understand that as the denominator increases, the parts get

smaller because you need more of them to make the whole. This will help them with comparing fractions.

d. Scaffold their previous learning about how the denominator affects the size of the part to comparing fractions with common numerators.

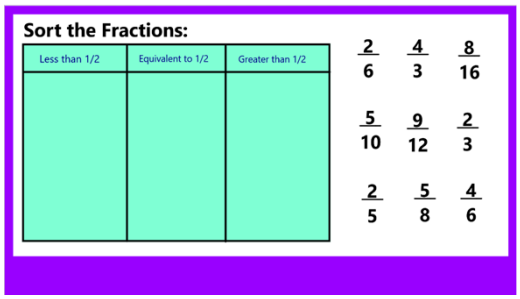


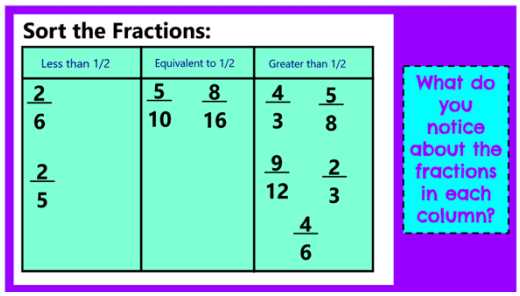
e. Use fraction bars and/or visual models to introduce comparing fractions with unlike numerators and denominators.

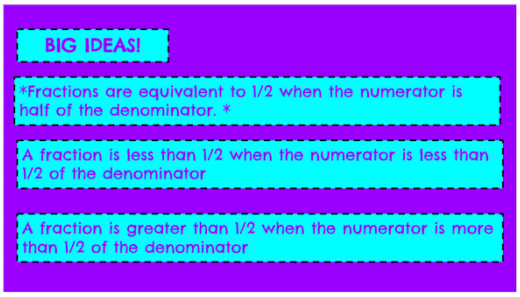


f. Draw upon students understanding of equivalent fractions to create common denominators to compare fractions

g. Before introducing benchmark fractions, students can use fraction bars to complete a sorting activity to sort fractions based on whether they are less than a half, equal to a half, or greater than a half. They should then engage in math talk to notice patterns in the relationship between the numerator and denominator when the fraction is less than a half, equal to a half, or greater than a half. This work will help them build fraction number sense as well as help them use benchmark fractions to compare.







h. Use blank number lines in communicators to have students practice comparing fractions using benchmarks. They should first determine a fraction is greater than, less than, or equal to a half. They can estimate where the fraction belongs on the number line. Then, they complete the same process for the second fraction. Students should recognize that the fraction farther to the right is the greater fraction.

i. Lesson Vocabulary: benchmark fraction, common denominator, compare, denominator, fraction, greater than symbol (>), less than symbol (<), numerator, unit fraction

11. **Understand Fraction Addition and Subtraction**- Guide students to think of operations with fractions as being like operations with whole numbers. Students should be taught that they can count with unit fractions just as you count with whole numbers. Also, because you can count with unit fractions, you can also do arithmetic with them.

a. Complete Lesson 19, Sessions 1-3 (2-3 Days)

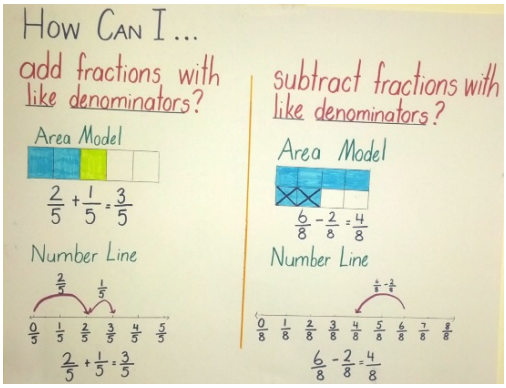
b. Possible strategies include but are not limited to:

   i. Number lines

   ii. Visual models

c. Begin by connecting the addition and subtraction of whole numbers to the addition and subtraction of fractions. For example, when adding whole numbers we think of 2 + 3 = 5. When adding fractions, we can use similar thinking 2 eighths + 3 eighths = 5 eighths (2/8 + ⅜ = ⅝).

d. Model adding and subtracting of fractions using a number line as well as using area models.



e. Lesson Vocabulary: denominator, fraction numerator, unit fraction

12. **Add and Subtract Fractions**- Students should be taught to decompose fractions as a sum of fractions with the same denominator in more than one way. Instruct students to use visual models to represent word problems involving the addition and subtraction of fractions with the same whole. Students should also be instructed to use equations to solve word problems.

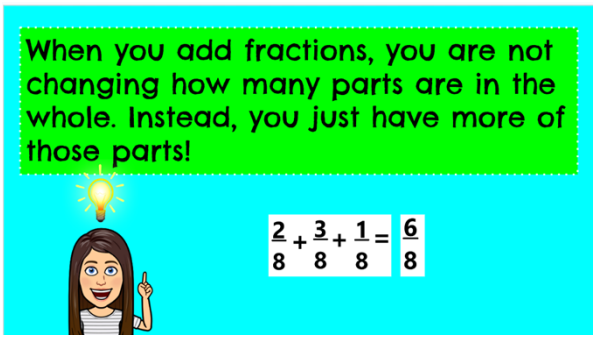
a. Complete Lesson 20, Sessions 1-5 (4-5 Days)

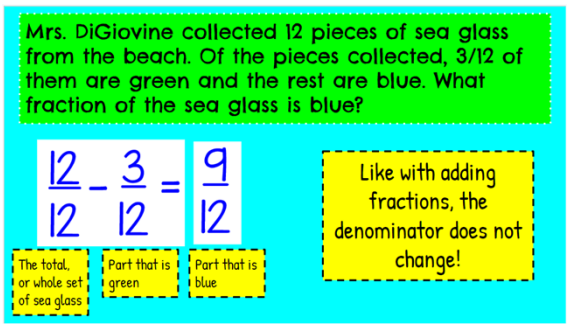
b. Possible strategies include but are not limited to:

   i. Visual models

   ii. Equations

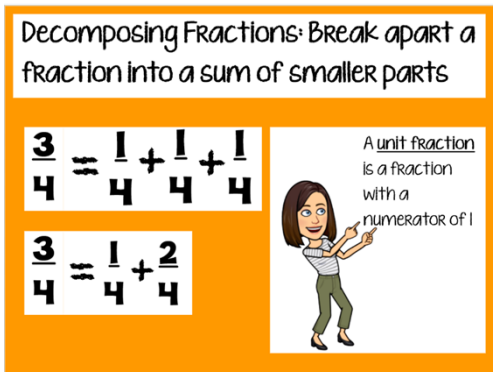
c. Begin by connecting to what students already know about modeling addition and subtraction of fractions. Use this understanding to help them develop addition and subtraction strategies. Guide students to understand why the denominator of a fraction does not change when adding or subtracting fractions.

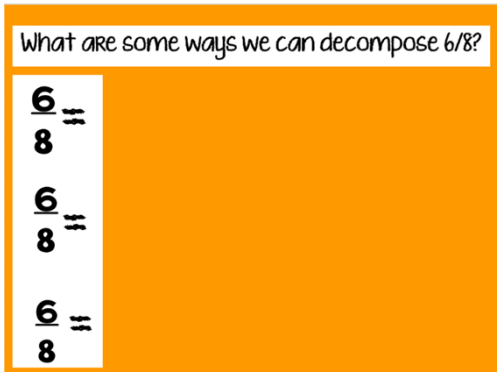




d. Discuss when you may need to add or subtract fractions in the real world. Provide students with ample practice solving word problems involving fractions so they learn to choose the appropriate operation.

e. Give students practice decomposing fractions in different ways. This can be a good turn and talk activity to see if partners can find all the ways to decompose a given fraction.





f. Lesson Vocabulary: denominator, fraction numerator, unit fraction

12. **Add and Subtract Mixed Numbers**- Students should be instructed to add and subtract mixed numbers with like denominators in two different ways. They should be taught to write the mixed number as a fraction greater than 1 and then apply what they have learned about addition and subtraction of fractions. They should also be taught to decompose fractions and add or subtract the whole-number parts then add or subtract the fractional parts. Students should also be taught to represent and solve word problems with equations that include mixed numbers with like denominators.

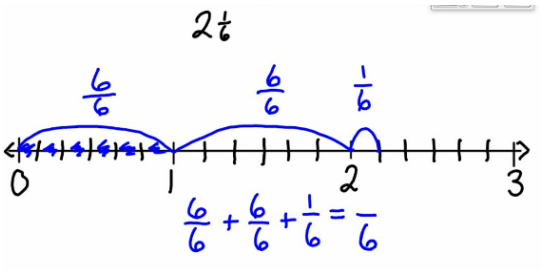
a. Complete Lesson 21, sessions 1-4 (4 Days)

b. Possible strategies include but are not limited to:

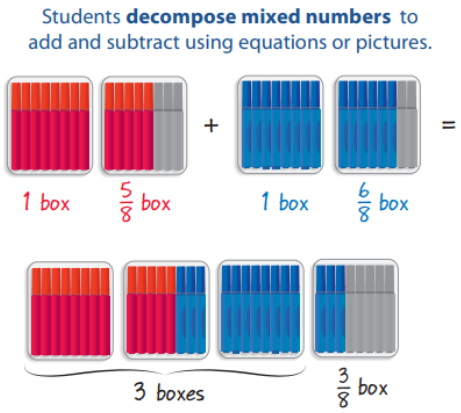
i. Rewriting fractions as a fraction greater than 1

ii. Decomposing fractions (regrouping)

c. Begin by reviewing how to decompose a number. Specifically focus on how you can decompose a fraction greater than 1, and rewrite it as an improper fraction.



d. Use visual models to help students decompose fractions for adding and subtracting mixed numbers



e. Provide word problems involving the addition and subtraction of mixed numbers.

f. Lesson Vocabulary: mixed number

13. **Add and Subtract Fractions in Line Plots**- Instruct students to use line plots to analyze measurement data. Teach them to make line plots to represent data given in fractional amounts that include eighths as well as halves and fourths. Students should be taught to apply their understanding of adding mixed numbers to solve word problems about the data. Students should be taught to create data-based questions, generate ideas based on the questions, and then refine the questions. Instruct students to develop strategies to collect various types of data and organize the data digitally. Students should be taught how to understand that the subsets of data can be selected and analyzed fora a particular purpose. Instruct student to analyze visualizations of a single data set, share explanations and draw conclusions that the data supports.

a. Complete Lesson 22, Sessions 1-5 (5-6 Days)

b. Students should create data-based questions, generate ideas based on the questions, and then refine the questions. For example: have discussions about consistency, about coming to an agreement about techniques (left foot or right foot? Shoes on or off? Standing or sitting?)
    a. Possible questions include but are not limited to (try to use fractional values): shoe size, amount of hours reading, Growth in a year, time spent on homework, measuring jumps students take from a set location and measure to the nearest 1/2 or 1/4 inch. blowing a puff ball with a straw from a set location to the nearest 1/4 or 1/2 inch. etc.
c. Students should develop strategies to collect various types of data and organize the data digitally.
    a. One way to do this is for students can create a Google form and create a line plot using Google Sheets
d. Students should be taught that subsets of data can be selected and analyzed for a particular purpose: for instance increasing reading stamina
e. Students should be taught to analyze visualizations of a single data set, share explanations and draw conclusions that the data supports. Students can discuss the data with a group.

f. Possible strategies include but are not limited to:

    i. Drawing line plots

    ii. pictures/diagrams

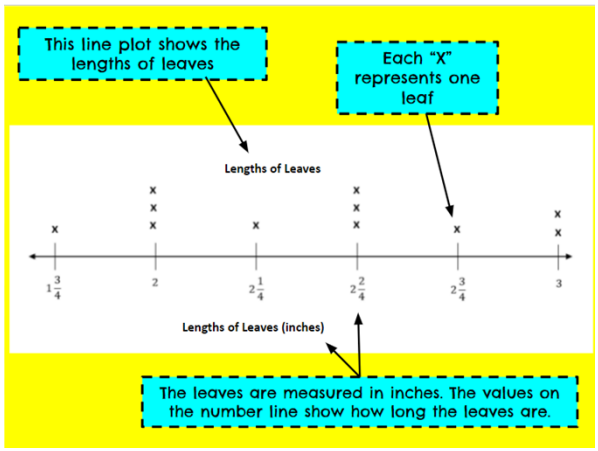
    iii. Illustrative Math Activity with Buttons

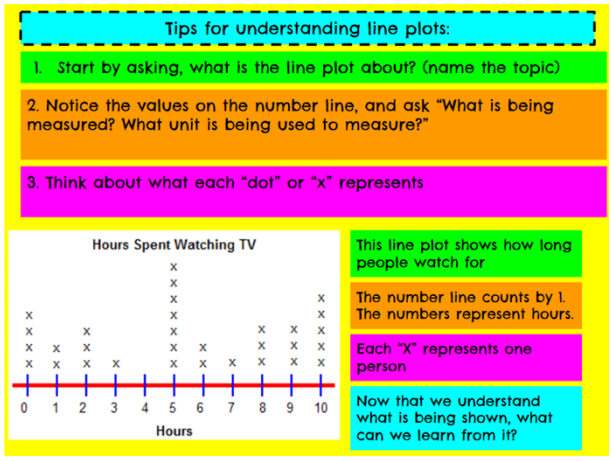
g. Begin by connecting to different types of graphs that students have seen and used before to activate prior knowledge.

h. Spend time discussing the different parts of a line plot. This can be confusing for students, so it is important that they understand the components of a line plot before they are able to analyze data and solve word problems.

Possible Misconceptions:

- Thinking the line plot needs a y-axis. Many graphs use an x-axis and y-axis but a line plot will only include an x-axis or number line.
- Incorrect scaling: Students might incorrectly scale the number line. For example, if the numeric data set includes fourths, the number line should be marked off in fourths, even if some of the fourths do not represent a data point.
- Missing labels: Forgetting to label the axes or title the graph can make it difficult for others to read and interpret the graph.
- Confusing line plots for other types of line graphs: Students might confuse line plots with other types of line graphs because they all involve lines, but line plots specifically show the frequency of data points along a number line, while other line graphs display trends or relationships between variables.





e. Give students additional practice with constructing line plots/analyzing data by having them take measurements of classroom objects, such as the length of pencils. Students can construct line plots and generate questions for others to answer.

f. Lesson Vocabulary: data, fraction, line plot, mixed number

Note: The instructor is encouraged to consult the supplemental resources located under materials to personalize and differentiate instruction for students, as well as address any learning gaps based on formative assessments.

Evidence/Performance Tasks

Formative Assessment:

- Fact Fluency Practice Assessments

- Administer Ready Math Lesson Quizzes at the end of each Lesson
- Administer Comprehension Check (digital)

Summative Assessments:

- Administer Ready Math Mid-Unit Assessments
- Administer Ready Math End of Unit Assessments

Benchmark Assessments:

- iReady Diagnostic
- Fact Fluency Assessment
- Acadience Assessment (As a reference, these assessments are not administered by the classroom teacher)

Alternative Assessments:

- Informal Observation
- Small Group Observation
- Exit Tickets
- Math Journal
- Oral and Written Explanations of Reasoning

Materials

The following are approved resources that teachers can include to further unit related objectives:

- Ready Math Teacher Toolbox Resources
    - Whole Class Instruction
        - Teach: Instruction & Practice, Interactive Tutorials,
        - Assess: Lesson Quizzes & Unit Assessments
    - Small Group Differentiation
        - Prepare: Prerequisite Lessons
        - Reteach: Tools for Instruction

        - Reinforce: Math Center Activities
        - Extend: Enrichment Activities
- Ready Math Workbook
- Ready Math Slides
- Digital Math Tools
- The First 10 Weeks Number Talks
- The Second 10 Weeks Number Talks
- The Third 10 Weeks Number Talks
- The Fourth 10 Weeks Number Talks
- Manipulatives: counters, tens frames, connecting cubes, base 10 blocks, fraction strips,
- White boards
- Number paths
- Hundred charts
- Blank Bar Models
- Grid Paper
- Blank Number Bonds
- CPS District Mathematics Google Drive Folder

Supplemental Resources:

- iReady My Path
- Learning Games
- Brain Pop
- Grade 4 NJSLA Questions Organized by Topic

Any additional resources that are not included in this list will be presented to and reviewed by the supervisor before being included in lesson plans. This ensures resources are reviewed and vetted for relevance and appropriateness prior to implementation.

Standards

In accordance with New Jersey's Chapter 32 Diversity and Inclusion Law, this unit includes instructional materials that highlight and promote diversity, including: equity, inclusion, and belonging in connection with gender and sexual orientation, race and ethnicity, disabilities, and religious tolerance.

MATH.K-12.1	Make sense of problems and persevere in solving them
MATH.K-12.2	Reason abstractly and quantitatively
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
MATH.4.OA.B.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.
MATH.K-12.4	Model with mathematics
MATH.K-12.5	Use appropriate tools strategically
MATH.K-12.6	Attend to precision
MATH.K-12.7	Look for and make use of structure
MATH.4.NBT.A.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.
MATH.K-12.8	Look for and express regularity in repeated reasoning
MATH.4.NBT.A.3	Use place value understanding to round multi-digit whole numbers to any place.
MATH.4.NBT.B.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.
MATH.4.NBT.B.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 model.
MATH.4.NF.A.1	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
MATH.4.NF.A.2	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
MATH.4.NF.B.3	Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
MATH.4.NF.B.3.a	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
MATH.4.NF.B.3.b	Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.
ELA.L.VL.4.2	Determine or clarify the meaning of unknown and multiple-meaning academic and domain-specific words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.

MATH.4.NF.B.3.c	Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
MATH.4.NF.B.3.d	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
MATH.4.M.A.1	Know relative sizes of measurement units within one system of units including km, m, cm, mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.
MATH.4.M.A.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems.
MATH.4.DL.A.1	Create data-based questions, generate ideas based on the questions, and then refine the questions.
MATH.4.DL.A.2	Develop strategies to collect various types of data and organize data digitally.
MATH.4.DL.A.3	Understand that subsets of data can be selected and analyzed for a particular purpose.
MATH.4.DL.A.4	Analyze visualizations of a single data set, share explanations and draw conclusions that the data supports.
MATH.4.DL.B.5	Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, ⅛). Solve problems involving addition and subtraction of fractions by using information presented in line plots.
ELA.SL.PE.4.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
ELA.SL.PE.4.1.C	Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
ELA.SL.PE.4.1.D	Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
WRK.K-12.P.1	Act as a responsible and contributing community members and employee.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
TECH.9.4.5.IML.3	Represent the same data in multiple visual formats in order to tell a story about the data.

Suggested Strategies for Modification

Possible accommodations/modification for Fourth Grade

Note: Teachers can find more specific modifications for English learners, learners with special needs,learners reading below grade level, and advanced learners on the Ready Math website.