Grade 4

Unit	Unit Title	Lesson	Day
3.2	Understanding Mixed Numbers	1 of 4	1-4

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
4.NF.3 Understand a fraction a/b with a>1 as a sum of fractions 1/b. 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.	•Add and subtract mixed numbers with like denominators. •Rename mixed numbers to subtract. •Use the properties of addition to add.	**SMP5** Use appropriate tools strategically. **SMP7** Look for and make use of structure.	How can you add and subtract mixed numbers with like denominators? How can you rename a mixed number to subtract? How can you add fractions with like denominators using the properties of addition?

5. Prerequisite Knowledge	6. Essential Vocabulary	7. Possible Misconceptions	8. Necessary Materials
•Add and subtract whole numbers. •Add and subtract fractions with like denominators. •Write a fraction greater than 1 as a mixed number. •Model a mixed number using fraction strips. •Subtract mixed numbers. •Decompose a fraction by writing it as a sum. •Add fractions and mixed numbers with like denominators. •Understand that the Commutative Property of Addition allows the order of addends to be changed. •Understand that the Associative Property of Addition allows the grouping of addends to be changed.			**OnCore** Lessons 58-60 Student pp. 115-120 Fraction strips **Investigations** Unit 6 Session 2.7A Resource Book pp. 32-34 K-5 Math Resources – activities for 4.NF.3c: Mixed Number Word Problems (like denominators) Adding Mixed Numbers Subtracting Mixed Numbers

Instruction

9. Instruction Practices (What are the teachers doing)	10. Learning Practices (What are the students doing)
Teachers will guide children to add and subtract mixed numbers following the lesson guidelines in OnCore lessons 58-60 (TM p. 61-63), teachers will: Review with students that a mixed number has a whole number part and a fraction part. Discuss that they can use what they know about adding and subtracting whole numbers and fractions to add and subtract mixed numbers. Give students an example in which the sum of the fractional part is more than 1 and discuss how to rewrite the sum so that the fractional part is less than 1. (e.g., sum of $10\frac{12}{8} = 11\frac{4}{8}$) •Remind students how when subtracting 2-digit numbers they sometimes needed to rename 1 ten into 10 ones and that now they will sometimes need to rename a whole number into fractional parts to subtract a larger fraction from a smaller fraction. •Review the Commutative and Associative Properties of Addition	In Lessons 58-60 students will: • Add and subtract mixed numbers. • Rename mixed numbers to subtract. • Use the properties of addition to add fractions. •Complete student pp.115-120 In Investigations Unit 6 Session 2.7A students will: • Make a line plot to display data set of measurements involving fractions. •Add and subtract mixed numbers with like denominators using representations and reasoning about fractions and the operations.

and remind students they may use these properties to make it easy to add fractions and mixed numbers as well as whole numbers. Check that students understand how to recognize fractions whose sum is 1. Ask students why using the properties to add the numbers was easier than adding the numbers in the order given. Remind students to focus on the fractional parts of the mixed numbers and look for sums that equal 1. Teachers will be following lesson activities from Investigations Unit 6 session 2.7A materials. (TM pp. CC52-CC56) In the activities teachers will: Have students look at the data on page C32 and ask them what they notice about the data. Draw the number line for the line plot on the board. Ask students what each of the tick marks between the whole numbers on the line plot represents; establish that each tick mark represents ¼ of an inch and the 2/4 is equivalent to ½. Have students use the data from the table to create a line plot. Make sure students understand where to place an X on the line plot. After the students complete the line plot, tell them to write statements about the data. When they are done, have them check their work with a neighbor. Have students work alone or with a partner to answer the questions on p. C33 and then do daily practice p. C34.	•Complete Resource Book pp. 32-34 •Add and subtract mixed numbers from the activities at K-5 Math Resources In K-5 Math Resources students will: • Solve mixed number word problems with like denominators. • Find two mixed numbers whose sum is 5 and explain the strategy they used to find them. • Find two mixed numbers whose difference is 3 ¼. and explain the strategy they used to find them

Grade 4

Unit	Unit Title	Lesson	Day
3.2	Understanding Mixed Numbers	2 of 4	5 - 6

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction *a/b* as a multiple of 1/*b*. *For example, use a visual fraction model to represent 5/4 as the product 5 X (1/4), recording the conclusion by the equation 5/4 = 5 X (1/4).*	Write a fraction as a product of a whole number and a unit fraction.	**SMP7** Look for and make use of structure.	How can you write a fraction as a product of a whole number and a unit fraction?

5. Prerequisite Knowledge	6. Essential Vocabulary	7. Possible Misconceptions	8. Necessary Materials
•Add fractions with like denominators. •Use multiples.	Unit Fraction Multiple		**OnCore** Lesson 65 Student pp. 129-130 K-5 Math Resources – activities for 4.NF.4a Models for Fraction Multiplication Numeral cards and Fraction dice

Instruction

9. Instruction Practices (What are the teachers doing)	10. Learning Practices (What are the students doing)
Teachers will guide children to write a fraction as a product of a whole number and a unit fraction following the lesson guidelines in OnCore lesson 65(TM p. 68), teachers will: Remind students of the meaning of multiple. Review fraction addition and define a unit fraction. Have students name some unit fractions and tell them they will express other fractions using unit fractions and multiples. Have students read the fraction sentence that shows 7/10 as the sum of unit fractions. Count the number of addends with the students and emphasize that the fraction sentence shows a repeated addition, which they know is the same as multiplication. Ask students to describe patterns they see.	In Lesson 65 students will: • Write fractions as the product of a whole number and a unit fraction. •Complete student pp.129-130 In K-5 Math Resources students will: Turn over a numeral card, roll a fraction die, and multiply the numeral by the fraction. Students will then represent models for fraction multiplication in an area model, on a number line and in an equation.

Grade 4

Unit	Unit Title	Lesson	Day
3.2	Understanding Mixed Numbers	3 of 4	7-10

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. b. Understand a multiple of *a/b* as a multiple of 1/*b*, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 X (2/5) as 6 X (1/5), recognizing this product as 6/5. (in general, n x (a/b) – (n x a)/b)*	•Write a product of a whole number and a fraction as a product of a whole number and a unit fraction. •Use a model to multiply a fraction by a whole number.	**SMP2** Reason abstractly and quantitatively. **SMP4** Model with mathematics.	How can you write a product of a whole number and a fraction as a product of a whole number and a unit fraction?

5. Prerequisite Knowledge	6. Essential Vocabulary	7. Possible Misconceptions	8. Necessary Materials
•Add fractions with like denominators. •Write multiples of unit fractions. •Understand multiplication as a number of equal groups. Multiply with unit fractions.			**OnCore** Lessons 66 and 67 Student pp. 131-134 K-5 Math Resources – activities for 4.NF.4b Multiplying a Number by a Fraction

Instruction

9. Instruction Practices (What are the teachers doing)	10. Learning Practices (What are the students doing)
Teachers will guide children to write a product of a whole number and a fraction as a product of a whole number and a unit fraction and use a model to multiply a fraction by a whole number following the lesson guidelines in OnCore lesson 65(TM p. 68), teachers will: Have students recall how to write multiples of a unit fraction and tell them they are now going to find multiples of other fractions. Draw a number line and have students explain how 3 X 2/5 = 6/5 is shown on the number line. Discuss how they could extend the number line to show 10/5. Guide students to realize that the units on the number line are unit fractions, so each fifth represents a product of a whole number and the unit fraction, 1/5. •Have students name various ways they have used models to show multiplication with whole numbers such as arrays, objects arranged in equal groups, and number lines. Tell them they can also use models to multiply a fraction by a whole number. Make sure students understand that 4 X 3/5 means 4 groups of 3/5 and show with the bar model that they can count the shaded fifths to find the product 12/5.	In Lessons 66-67 students will: • Write a product of a whole number and a fraction as a product of a whole number and a unit fraction. •Use a model to multiply a fraction by a whole number. •Complete student pp.131-134 In K-5 Math Resources students will: Use a fraction model to represent and solve problems.

Grade 4

Unit	Unit Title	Lesson	Day
3.2	Understanding Mixed Numbers	4 of 4	11-15

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*	•Multiply a fraction by a whole number to solve a problem. •Use the strategy *draw a diagram* to solve comparison problems with fractions.	**SMP1** Make sense of problems and persevere in solving them. **SMP3** Construct viable arguments and critique the reasoning of others.	•How can you multiply a fraction by a whole number to solve a problem? •How can you use the strategy *draw a diagram* to solve comparison problems with fractions?
5. Prerequisite Knowledge	**6. Essential Vocabulary**	**7. Possible Misconceptions**	**8. Necessary Materials**
Rename mixed numbers as fractions and fractions as mixed numbers.	Mixed number		**OnCore** Lesson 68 and 69 Student pp. 135-138 **Investigations** Unit 6 Session 3A.1-3A.3 Resource Book pp. C35--C42 and C44-C46 K-5 Math Resources – activities for 4.NF.4c Whole Number x Fraction Word Problems

Instruction

9. Instruction Practices (What are the teachers doing)	10. Learning Practices (What are the students doing)
Teachers will guide children to multiply a fraction by a whole number to solve a problem and use the strategy draw a diagram to solve comparison problems with fractions following the lesson guidelines in OnCore lesson 65(TM p. 68), teachers will: •Ask students to explain and illustrate what a mixed number is and review how to write a fraction as a mixed number and a mixed number as a fraction. Have students rename a mixed number as a fraction and then multiply. Discuss how to multiply two fractions: multiply the numerators and multiply the denominators. Point out that the product is greater than 1 so they should simplify by writing it as a mixed number. In the example be sure that students understand how listing 18 fourths and grouping 4 fourths into wholes shows the conversion of the fraction to a mixed number. •Review how use a comparison bar diagram with whole numbers and tell students they can draw a similar diagram to solve comparison problems with fractions. Teachers will be following lesson activities from Investigations Unit 6 sessions 3A.1-3A.3 materials. (TM pp. CC57-CC70) In the activities teachers will: Go over strategies for multiplying fractions. Give students time to work with a partner to solve problems. Check to see if students can write equations for the problems.	In Lessons 68-69 students will: • Multiply a whole number by a fraction or a mixed number and write the product as a mixed number. •Use the strategy *draw a diagram* to solve comparison problems with fractions. •Complete student pp.135-138 In Investigations Unit 6 Session 3A.1-3A.3 students will: • Multiply a whole number by a fraction •Use visual models to solve word problems involving multiplication of a whole number and a fraction. In K-5 Math Resources students will: •Solve problems with whole numbers times fractions.