|  |  |  |
| --- | --- | --- |
| **Prerequisite Skills**  **(Grade 4)** | **Unit Five Standards**  **Grade 5** | **Looking Ahead**  **(Grade 6)** |
| Fraction x Whole Number  Understand a/b is a multiple of 1/b ( 5/4 = 5 x ¼ ).  Solve word problems with visual fraction models and equations (fraction x whole number).  Apply area and perimeter formulas for rectangles. | Number and Operations Fractions 3: Interpret a fraction as division of the numerator by the denominator (*a*/*b* = *a* ÷ *b*). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting* *that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared* *equally among 4 people each person has a share of size 3/4. If 9 people* *want to share a 50-pound sack of rice equally by weight, how many* *pounds of rice should each person get? Between what two whole numbers* *does your answer lie?*   * I can interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b) * I can solve word problems involving division of whole numbers with quotients as fractions or mixed numbers. | Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.  Find the area of right triangles, other triangles, special  quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. |
| Number and Operations Fractions 4a + 4b: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.  a. Interpret the product (*a*/*b*) × *q* as *a* parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence ofoperations *a* × *q* ÷ *b*. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*  b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.   * I can multiply fractions (which includes multiplying fractional side lengths to find the area of a rectangle). |
| Express measurements in a larger unit in terms of a smaller unit and record as number pairs (1,12) (2,24) (3,36)…  Word problems with all operations that involve: distance, time, volume, ,mass, money – including simple fractions and decimals.  Solve word problems with visual fraction models and equations (fraction x whole number). | Number and Operations Fractions 5: Interpret multiplication as scaling (resizing), by:.  b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence *a*/*b* = (*n*×*a*)/(*n*×*b*) to the effect of multiplying *a*/*b* by 1.   * I can explain why multiplying an improper fraction by a whole number will result in a product greater than the whole number. * I can explain why multiplying a fraction by one (which can be written as various fractions, ex. 2/2, 3/3 , etc.) results in an equivalent fraction. * I can explain why multiplying a fraction by a fraction will result in a product smaller than the factors. | Apply and extend previous understandings of multiplication and division to divide fractions by fractions.  Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.  In sixth grade, they will use this foundational understanding to divide into and by more complex fractions and develop abstract methods of dividing by fractions. |
| Number and Operations Fractions 6: Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.   * I can represent and solve word problems involving multiplication of fractions and mixed numbers. |

|  |  |  |
| --- | --- | --- |
| **Prerequisite Skills**  **(Grade 4)** | **Unit Five Standards (Continued)**  **Grade 5** | **Looking Ahead**  **(Grade 6)** |
| Know relative size of units including (km, m, cm, kg, g, lb, oz, l, ml, hr, min, sec)  Express measurements in a larger unit in terms of a smaller unit and record as number pairs (1,12) (2,24) (3,36)…  Word problems with all operations that involve: distance, time, volume, ,mass, money – including simple fractions and decimals.  Solve word problems with visual fraction models and equations (fraction x whole number) | Number and Operations Fractions 7: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.  a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain*  *that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*   * I can represent division of a fraction by a non-zero whole number.   b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for* *4 ÷ (1/5), and use a visual fraction model to show the quotient. Use* *the relationship between multiplication and division to explain that*  *4 ÷ (1/5) = 20 because 20 × (1/5) = 4.*   * I can represent division of a whole number by a fraction.   c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each* *person get if 3 people share 1/2 lb of chocolate equally? How many* *1/3-cup servings are in 2 cups of raisins?*   * I can represent division of a fraction by a non-zero whole number and a whole number by a fraction to solve real world problems. | Apply and extend previous understandings of multiplication and division to divide fractions by fractions.  Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.  Compute fluently with multi-digit numbers and find common factors and multiples.  In sixth grade, they will use this foundational understanding to divide into and by more complex fractions and develop abstract methods of dividing by fractions. |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Number and Operations Fractions 3:  Interpret a fraction as division of the numerator by the denominator (*a*/*b* = *a* ÷ *b*). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting* *that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared* *equally among 4 people each person has a share of size 3/4. If 9 people* *want to share a 50-pound sack of rice equally by weight, how many* *pounds of rice should each person get? Between what two whole numbers* *does your answer lie?* | * I can interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). * I can solve word problems involving division of whole numbers with quotients as fractions or mixed numbers. |  |  |  |  | | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | Students need ample experiences to explore the concept that a fraction is a way to represent the division of two quantities. Students are expected to demonstrate their understanding using concrete materials, drawing models, and explaining their thinking when working with fractions in multiple contexts. They read 3/5 as ―three fifths‖ and after many experiences with sharing problems, learn that 3/5 can also be interpreted as ―3 divided by 5.‖ | | | | **Examples:** | | | | Ten team members are sharing 3 boxes of cookies. How much of a box will each student get?  *When working this problem a student should recognize that the 3 boxes are being divided into 10 groups, so she is seeing the solution to the following equation, 10 x n = 3 (10 groups of some amount is 3 boxes) which can also be written as n = 3*  *÷ 10. Using models or diagram, they divide each box into 10 groups, resulting in each team member getting 3/10 of a box.* | Two afterschool clubs are having pizza parties. For the Math Club, the teacher will order 3 pizzas for every 5 students. For the student council, the teacher will order 5 pizzas for every 8 students. Since you are in both groups, you need to decide which party to attend. How much pizza would you get at each party? If you want to have the most pizza, which party should you attend? | The six fifth grade classrooms have a total of 27 boxes of pencils. How many boxes will each classroom receive? Students may recognize this as a whole number division problem but should also express this equal sharing problem as 27/6. They explain that each classroom gets 27/6 boxes of pencils and can further determine that each classroom get 4 3/6 or 4 ½ boxes of pencils. |  |  | | --- | | **Lessons and Resources for Number and Operations Fractions 3** | | See Optional Lesson Progression |  |  |  |  | | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | [1. Make sense of problems and persevere in solving them.](http://elementarymath.dmschools.org/1-make-sense-of-problems-and-persevere-in-solving-them5.html) | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively3.html) | [3. Construct viable arguments and critique the reasoning of others.](http://elementarymath.dmschools.org/3-construct-viable-arguments-and-critique-the-reasoning-of-others2.html) | | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics.html) | [5. Use appropriate tools strategically.](http://elementarymath.dmschools.org/5-use-appropriate-tools-strategically5.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure.html) | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  | | --- | --- | --- | --- | | **Standard** | | **Learner Objectives** | | | Number and Operations Fractions 4a:  Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.  a. Interpret the product (*a*/*b*) × *q* as *a* parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence ofoperations *a* × *q* ÷ *b*. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*. | | * I can multiply fractions. | | | Number and Operations Fractions 4b:  b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. | | * I can multiply fractional side lengths to find the area of a rectangle. | |  |  | | --- | | **What does this standard mean the students will know and be able to do?** | | Students need to develop a fundamental understanding that the multiplication of a fraction by a whole number could be represented as repeated addition of a unit fraction. For example: 2 x (1/4) = 1/4 + 1/4  In fifth grade, students are expected to multiply fractions including proper fractions, improper fractions, and mixed numbers. They multiply fractions efficiently and accurately as well as solve problems in both contextual and non-contextual situations. This standard references both the multiplication of a fraction by a whole number and the multiplication of two fractions. Visual fraction models (area models, tape diagrams, number lines) should be used and created by students during their work with this standard.  As they multiply fractions such as 3/5 x 6, they can think of the operation in more than one way.   * 3 x (6 ÷ 5) or (3 x 6/5) * (3 x 6) ÷ 5 or 18 ÷ 5 (18/5)   Students create a story problem for 3/5 x 6 such as,   * Isabel had 6 feet of wrapping paper. She used 3/5 of the paper to wrap some presents. How much does she have left? * Every day Tim ran 3/5 of mile. How far did he run after 6 days? (Interpreting this as 6 x 3/5) |  |  | | --- | | **Lessons and Resources for Number and Operations Fractions 4a + 4b** | | See Optional Lesson Progression |  |  |  |  |  | | --- | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | | [1. Make sense of problems and persevere in solving them.](http://elementarymath.dmschools.org/1-make-sense-of-problems-and-persevere-in-solving-them5.html) | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively3.html) | [3. Construct viable arguments and critique the reasoning of others.](http://elementarymath.dmschools.org/3-construct-viable-arguments-and-critique-the-reasoning-of-others2.html) | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics.html) | | [5. Use appropriate tools strategically.](http://elementarymath.dmschools.org/5-use-appropriate-tools-strategically5.html) | [6. Attend to precision.](http://elementarymath.dmschools.org/6-attend-to-precision3.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure.html) | [8. Look for and express regularity in repeated reasoning.](http://elementarymath.dmschools.org/8-look-for-and-express-regularity-in-repeated-reasoning.html) | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Number and Operations Fractions 5:  Interpret multiplication as scaling (resizing), by:  b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence *a*/*b* = (*n*×*a*)/(*n*×*b*) to the effect of multiplying *a*/*b* by 1. | * I can explain why multiplying an improper fraction by a whole number will result in a product greater than the whole number. * I can explain why multiplying a fraction by one (which can be written as various fractions, ex. 2/2, 3/3 , etc.) results in an equivalent fraction. * I can explain why multiplying a fraction by a fraction will result in a product smaller than the factors. |  |  |  | | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | NF.5b asks students to examine how numbers change when we multiply by fractions. Students should have ample opportunities to examine both cases in the standard: a) when multiplying by a fraction greater than 1, the number increases and b) when multiplying by a fraction less the one, the number decreases. This standard should be explored and discussed while students are working with NF.4, and should not be taught in isolation. | | | **NF.5b Examples:** | | | Mrs. Bennett is planting two flower beds. The first flower bed is 5 meters long and 6/5 meters wide. The second flower bed is 5 meters long and 5/6 meters wide. How do the areas of these two flower beds compare? Is the value of the area larger or smaller than 5 square meters? Draw pictures to prove your answer. | 2 x 8 must be more than 8 because 2 groups of 8 is 16 and 2 is almost 3 groups of 8. So the answer must be close to, but less than 24. |  |  | | --- | | **Lessons and Resources for Number and Operations Fractions 5** | | See Optional Lesson Progression |  |  |  |  |  | | --- | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively3.html) | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics.html) | [6. Attend to precision.](http://elementarymath.dmschools.org/6-attend-to-precision3.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure.html) | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Number and Operations Fractions 6:  Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. | * I can represent and solve word problems involving multiplication of fractions and mixed numbers. |  |  |  |  |  | | --- | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | | This standard builds on all of the work done in this cluster. Students should be given ample opportunities to use various strategies to solve word problems involving the multiplication of a fraction by a mixed number. This standard could include fraction by a fraction, fraction by a mixed number or mixed number by a mixed number. | | | | | **Example**  **There are 2 ½ bus loads of students standing in the parking lot. The students are getting ready to go on a field trip. 2/5 of the students on each bus are girls. How many busses would it take to carry only the girls?** | | | | | **Student 1**  I drew 3 grids and 1 grid represents 1 bus. I cut the third grid in half and I marked out the right half of the third grid, leaving 2 ½ grids. I then cut each grid into fifths, and shaded two-fifths of each grid to represent the number of girls. When I added up the shaded pieces, 2/5 of the 1st and 2nd bus were both shaded, and 1/5 of the last bus was shaded. |  | **Student 2**  2 ½ x 2/5=  I split the 2 ½ into 2 and ½  2 x 2/5 = 4/5  ½ x 2/5 = 2/10  I then added 4/5 and2/10. That equals 1 whole bus load. | | | **Example**  **Evan bought 6 roses for his mother. 2/3 of them were red. How many red roses were there?** | | | | | **Student 1**  Using a visual, student 1 divides the 6 roses into 3 groups and counts how many are in 2 of the 3 groups |  | **Student 2**  Student 2 uses an equation to solve. |  |  |  | | --- | | **Lessons and Resources for Number and Operations Fractions 6** | | See Optional Lesson Progression |  |  |  |  |  | | --- | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | | [1. Make sense of problems and persevere in solving them.](http://elementarymath.dmschools.org/1-make-sense-of-problems-and-persevere-in-solving-them5.html). | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively3.html) | [3. Construct viable arguments and critique the reasoning of others.](http://elementarymath.dmschools.org/3-construct-viable-arguments-and-critique-the-reasoning-of-others2.html) | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics.html) | | [5. Use appropriate tools strategically.](http://elementarymath.dmschools.org/5-use-appropriate-tools-strategically5.html) | [6. Attend to precision.](http://elementarymath.dmschools.org/6-attend-to-precision3.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure.html) | [8. Look for and express regularity in repeated reasoning.](http://elementarymath.dmschools.org/8-look-for-and-express-regularity-in-repeated-reasoning.html) | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **Standard** | **Learner Objectives** | | Number and Operations Fractions 7:  Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.  a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.* | * I can represent division of a fraction by a non-zero whole number. | | b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for* *4 ÷ (1/5), and use a visual fraction model to show the quotient. Use* *the relationship between multiplication and division to explain that4 ÷ (1/5) = 20 because 20 × (1/5) = 4.* | * I can represent division of a whole number by a fraction. | | c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each* *person get if 3 people share 1/2 lb of chocolate equally? How many* *1/3-cup servings are in 2 cups of raisins?* | * I can represent division of a fraction by a non-zero whole number and a whole number by a to solve real world problems. |  |  |  |  | | --- | --- | --- | | **What does this standard mean the students will know and be able to do?** | | | | This standard is the first time that students are dividing with fractions. In fourth grade students divided whole numbers, and multiplied a whole number by a fraction. In fifth grade, students experience division problems with whole number divisors and unit fraction dividends (fractions with a numerator of 1) or with unit fraction divisors and whole number dividends. For example, the fraction 3/5 is 3 copies of the unit fraction 1/5. 1/5+1/5+1/5=3/5 = 1/5 x 3 or 3 x 1/5.  Students extend their understanding of the meaning of fractions, how many unit fractions are in a whole, and their understanding of multiplication and division as involving equal groups or shares and the number of objects in each group/share. In sixth grade, they will use this foundational understanding to divide into and by more complex fractions and develop abstract methods of dividing by fractions. | | | | **NF.7a** asks students to work with story contexts where a unit fraction is divided by a non-zero whole number. Students should use various fraction models and reasoning about fractions. | **NF.7b** calls for students to create story contexts and visual fraction models for division situations where a whole number is being divided by a unit fraction. | **NF.7c** Extends students’ work from other standards in 5.NF.7. Students should continue to use visual fraction models and reasoning to solve these real-world problems. | | **Example 7a**  You have 1/8 of a bag of pens and you need to share them among 3 people. How much of the bag does each person get? | **Example 7b**  Create a story context for 5 ÷ 1/6. Find your answer and then draw a picture to prove your answer and use multiplication to reason about whether your answer makes sense. How many 1/6 are there in 5? | **Example 7c**  How many 1/3-cup servings are in 2 cups of raisins? |  |  | | --- | | **Lessons and Resources for Number and Operations Fractions 7** | | See Optional Lesson Progression |  |  |  |  |  | | --- | --- | --- | --- | | **Emphasized Standards for Mathematical Practice** | | | | | [1. Make sense of problems and persevere in solving them.](http://elementarymath.dmschools.org/1-make-sense-of-problems-and-persevere-in-solving-them5.html) | [2. Reason abstractly and quantitatively.](http://elementarymath.dmschools.org/2-reason-abstractly-and-quantitatively3.html) | [3. Construct viable arguments and critique the reasoning of others.](http://elementarymath.dmschools.org/3-construct-viable-arguments-and-critique-the-reasoning-of-others2.html) | [4. Model with mathematics.](http://elementarymath.dmschools.org/4-model-with-mathematics.html) | | [5. Use appropriate tools strategically.](http://elementarymath.dmschools.org/5-use-appropriate-tools-strategically5.html) | [6. Attend to precision.](http://elementarymath.dmschools.org/6-attend-to-precision3.html) | [7. Look for and make use of structure.](http://elementarymath.dmschools.org/7-look-for-and-make-use-of-structure.html) | [8. Look for and express regularity in repeated reasoning.](http://elementarymath.dmschools.org/8-look-for-and-express-regularity-in-repeated-reasoning.html) | |

**Optional Whole Group Lesson Progression**

Unit Pacing: 8 weeks

|  |  |  |  |
| --- | --- | --- | --- |
| **Resource** | **Location** | **Primary Focus** | **Standard** |
| **NOTE: This unit will begin with continuing work on fraction equivalence, mixed /improper fractions, and addition/subtraction of fractions. This will strengthen students understanding of these critical concepts and support the work they will do with multiplication and division of fractions.** | | | |
| Fourth Number and Operations in Fractions 1: Explain why a fraction *a*/*b* is equivalent to a fraction (*n* × *a*)/(*n* × *b*) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.   * I can recognize and identify equivalent fractions. * I can determine equivalent fractions using fraction models and explain why they can be called “equivalent”. | | | 4.NF.1 |
| Equivalent Fractions (2-3 weeks) | | |  |
| [Fractions on a Clock](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/1clock_fractions.pdf) | Sharepoint | This is a very powerful model for equivalent fractions. | 4.NF.1 |
| [Fraction Strips](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/fractionstrips.pdf) | Sharepoint | There are specific directions for this activity. Since students have had work with fractions already this year, it is recommended that students grapple with how to mark the strips as indicated in the directions rather than “tell” students how to fold the strips. | 4.NF.1 |
| [Fraction Tracks](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/fractiontracks.pdf) | Sharepoint | There are several activities listed within Fraction Tracks. Each activity leads into the next. They should be done in order. More than one activity can be done in a class period. Some activities can be repeated. | 4.NF.1 |
| [Missing Number Equivalencies](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/4missingnumberequal.pdf) | Sharepoint | This is a repeated activity from Unit 3. | 4.NF.1 |
| [Slicing Squares](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/5slicingsquares.pdf) | Sharepoint | This is a repeated activity from Unit 3. | 4.NF.1 |
| [Practice](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/6equalsimplifying.pdf) | Sharepoint | Continue to give students practice opportunities throughout the unit. | 4.NF.1 |
| Mixed and Improper Fractions (1 week) | | |  |
| [Fractional Parts Counting](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/fractional_parts_counting.pdf) | Sharepoint | These activities are critical to students’ conceptual understanding. Repeat as needed. | 4.NF.1 |
| [Mixed Number and Improper Fractions Activity](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/mixed_number_and_improper_fractions.pdf) | Sharepoint | 4.NF.1 |
| [Practice](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/mixed_fractions_and_improper_fractions_practice.pdf) | Sharepoint | 4.NF.1 |
| Adding and Subtracting Fractions (1 week) | | |  |
| [Compare Fractions to](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/comparing_fractions_to_benchmarks.pdf)  [Benchmarks](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/comparing_fractions_to_benchmarks.pdf) | Sharepoint | It is critical for students to be able to look at a fraction operation problem and use benchmark fractions to estimate the answer. This activity reinforces the idea of comparing a fraction to ½ to reason about its size. This is a very important skill in estimating when operating with fractions. Teachers should continue to give student 1-2 fractions several times each week in a whole class discussion or Daily Math Review. | 4.NF.1 |
| [First Estimates](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/first_estimates.pdf) | Sharepoint | This activity ties together the previous activity as it requires students to use their knowledge of a benchmark to estimate a sum or difference. This is such an important skill that teachers should discuss reasonable estimates for problems regularly! | 4.NF.1 |
| [Addition and Subtraction of Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/add_sub_fractions_practice.pdf) | Sharepoint | There are some practice sheets provided, but students will need more practice. As students move into multiplication and division of fractions, they will need to keep practicing addition and subtraction. Give problems in context so students will have to think about which operation to use. | 4.NF.1 |
| Multiplication of Fractions (2-3 weeks) | | |  |
| [Multiplying a Fraction by a Whole Number](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/pbit1%20(2).docx) | Sharepoint – PBIT 1 | * I can multiply fractions. * I can represent and solve word problems involving multiplication of fractions and mixed numbers. | 5.NF.4  5.NF.6 |
| [Practice with Multiplying a Fraction by a Whole Number](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/fraction_by_fraction_and_fraction_by_whole_number_practice.docx) | Sharepoint |
| [Multiplying a Fraction by a Fraction](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/pbit2%20(1).docx) | Sharepoint – PBIT 2 |

**Optional Whole Group Lesson Progression (Contined)**

Unit Pacing: 8 weeks

|  |  |  |  |
| --- | --- | --- | --- |
| **Resource** | **Location** | **Primary Focus** | **Standard** |
| [Multiplying a Fraction by a Fraction](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/pbit3.docx) | Sharepoint – PBIT 3 | * I can multiply fractions. * I can explain why multiplying a fraction by a fraction will result in a product smaller than the factors. * I can represent and solve word problems involving multiplication of fractions and mixed numbers. | 5.NF.4  5.NF.5  5.NF.6 |
| [Practice with Multiplying a Fraction by a Fraction](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/multiplying_a_fraction_by_a_fraction_practice%20(2).docx) | Sharepoint |
| [Multiplying a Whole Number by a Mixed Fraction](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/pbit4.docx) | Sharepoint – PBIT 4 |
| [Multiplying Mixed Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/pbit5.docx) | Sharepoint – PBIT 5 |
| [Multiplying Mixed Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/pbit6.docx) | Sharepoint – PBIT 6 |
| [Practice with Multiplying a Fraction by a Mixed Number](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/multiplying_a_fraction_by_a_mixed_fraction_practice.docx) | Sharepoint |
| [Practice Multiplying Mixed Fractions](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/multiplying_mixed_fractions_practice.docx) | Sharepoint |
| Division with Fraction Remainders | | |  |
| [Whole Number Divided by a Unit Fraction](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/pbit7.docx) | Sharepoint – PBIT 7 | * I can represent division of a fraction by a non-zero whole number. * I can represent division of a whole number by a fraction. * I can represent division of a fraction by a non-zero whole number and a whole number by a fraction to solve real world problems. | 5.NF.7 |
| [Whole Number Divided by a Unit Fraction](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/pbit8.docx) | Sharepoint – PBIT 8 |
| [Whole Number Divided by a Unit Fraction](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/pbit8.docx) | Sharepoint – PBIT 8 |
| [Whole Number Divided by a Unit Fraction](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/whole_number_divided_by_unit_fraction_practice.docx) | Sharepoint |
| [Unit Fraction Divided by a Whole Number](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/pbit9.docx) | Sharepoint – PBIT 9 |
| [Unit Fraction Divided by a Whole Number](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/pbit10.docx) | Sharepoint – PBIT 10 |
| [Unit Fraction Divided by a Whole Number](https://sharepoint.dmps.k12.ia.us/sites/divisions/curr/Public%20Curriculum%20Documents/Mathematics/Elementary%20Math%202013%20-%202014/5th%20Grade/Unit%205/unit_fraction_divided_by_whole_number_practice.docx) | Sharepoint |

**\*Unit pacing is approximate. Some lessons may take more than one day. Use teacher discretion based on student need when planning unit length.**