Unit 3 Parent Guide

Lesson 1--Place Value and Whole Number Division--Helpful Hints

*Students were reminded of long division strategies and place value hints in order to help them with whole number division. Steps for the division process are below.

Example: 4,578 ÷ 32

Step 1: Divide. We know that 32 will not go into 4 so ask yourself "how many times does 32 go into 45?"

$$32\overline{)4{,}578}\quad 1$$

Step 2: Multiply. Multiply 1 x 32 and place it underneath 45

$$32\overline{)4{,}578}\quad 1,\ 32$$

Step 3: Subtract. Subtract 32 from 45.

$$32\overline{)4{,}578}\quad 1,\ -32,\ 13$$

Step 4: Bring Down. Bring down the 7 and line it up next to the 3

$$32\overline{)4{,}578}\quad 1,\ -32\downarrow,\ 137$$

Step 5: Repeat the steps until you no longer have any numbers to bring down. Please refer to the rest of the steps that have been completed off to the side.

Completed Problem

$$32\overline{)4{,}578}\quad 143\ r1,\ -32\downarrow,\ 137\ (13\to 2,\ 17),\ -128,\ 98,\ -97,\ 1$$

*Lesson 2--Estimated Multipliers in Division--Helpful Hints

*Today's focus is very similar to yesterday's instruction, but students were introduced to estimating the divisor in order to complete the division problem in a different way. The homework assignment is also mainly word problems. Below is an example division word problem.

Example: For all 6th grade students to go on a field trip it will cost $407. How much money did it cost for each student to attend if there are 75 6th grade students? Give your answer to the nearest cent.

Step 1: Divide. We know that 75 will not go into 4 or 40 so ask yourself "how many times does 75 go into 407?"

$$75\overline{)407}\quad 5$$

Step 2: Multiply. Multiply 1 x 32 and place it underneath 45

$$75\overline{)407}\quad 5,\ 375$$

Step 3: Subtract. Subtract 32 from 45.

$$75\overline{)407}\quad 5,\ -375\ (407\to 10,\ 3),\ 32$$

Step 4: In order to give the answer to the nearest cent, I will have to add a decimal point and a zero and then bring down the zero.

Completed Problem

$$75\overline{)407.00}\quad 5.42,\ -375\ (407\to 10,\ 3),\ 320,\ -300,\ 200,\ -150,\ 50$$

```
      5.
75 | 407.0
   -375
     320
```

Step 5: Repeat the steps until you have an answer to the nearest cent (2 numbers behind the decimal point.) Please refer to the rest of the steps that have been completed in the box on the previous page.

*Lesson 3--Multiplying by a Decimal--Helpful Hints

*Today students reviewed how to multiply with decimals. The strategy they learned was to multiply the numbers normally and then place the decimal in the answer based off of how many numbers were behind the decimal in both numbers in the problem. For example: If the numbers to be multiplied were 4.07 and 5.4, there are 3 total numbers behind the decimal (the 0, the 7 and the 4) so once the answer is found, the student would need to place the decimal in a spot that would put 3 numbers behind it.

Example: 8.45 x 3.2 =

Step 1: Set up the problem. Reminder--when you set up a multiplication problem with decimals, the decimals DO NOT need to be lined up. The number with more digits should be placed on top:

```
  8.45
x 3.2
```

Step 2: Multiply normally (you can ignore the decimals for now)

```
   1
 1 1
  8.45
x 3.2
 1 1
 1690
+25350
 27040
```

Step 3: Count how many numbers are behind the decimal in the original problem. In this example, there are 3 numbers behind the decimal (the 4, the 5 and the 2).

Step 4: Place the decimal in the answer so that there are 3 numbers behind the decimal point

27.040

*Lesson 4--Decimal Divisors --Helpful Hints

*Today students learned how to divide with decimals. The strategy they learned was to move the decimal point in the divisor(outside number) to the very end of the number. But when you move the decimal in the divisor you must also move the decimal point in the dividend (inside number) even if that means adding zeros to the end of the number.

Example: 4.58 ÷ .03

Step 1: Move the decimal point on the outside number to the end

```
.03 | 4.58
```

move the decimal point 2 places

Step 2: Move the decimal point on the inside number the SAME amount of places that you had to move the outside number.

```
03. | 4.58
```

move the decimal point 2 places

Step 3: Divide the numbers how you normally would repeating the division steps until you find a repeating decimal or get to the hundredths place (2 numbers behind the decimal) Don't forget to bring up the decimal point once you are finished dividing. See completed problem in the box.

Completed Problem

```
   | 152.6
03. 458.0
  -3
   15
  -15
    08
   -6
    20
   -18
     2
```

*Lesson 5--Multiplication or Division--Helpful Hints

*Today, students continued to practice the skill of multiplying and dividing decimals by working with word problems. Below are 2 sample word problems to help identify key words that should help students know whether they should multiply or divide.

Example 1: A wallet size photo measures 2.5 inches by 3.5 inches. What is the area of a wallet-size photo? This is a MULTIPLICATION problem because it is asking us to find the area of an object and the formula for finding are is length x width.

Example 2: The Washington's backyard has an area of 55.48 square meters. If the length of the yard is 7.6 meters, what is the width? This is a DIVISION problem because we already have the area of the shape, so we must use the inverse (opposite) operation for finding area in order to find the missing side.

*Lesson 6--Comparing, Adding and Subtracting with the Same Unit--Helpful Hints

*Students were taught/reminded of strategies for comparing fractions and decimals as well as adding and subtracting fractions with like denominators. Reminders and examples for the different situations are shown below.

Reminders about Comparing Fractions:

*If the **numerators are the same**, the fraction with the **lesser denominator is greater** because its unit fractions are greater.

*If the **denominators are the same**, the fraction with the **greater numerator is greater** because it represents more unit fractions.

*For mixed numbers, if the **whole numbers are different,** the number with the **greater whole number is greater**. If the **whole numbers are the same**, the number with the **greater fraction or decimal part is greater.**

Reminders for Comparing Decimals:

*Students should line up the decimals by stacking one number on top of the other.

*Then they can move from one place value to another until they find a difference.

*Once they have found a difference, they must decide which number is bigger. That is the bigger number!

Example: Which is bigger 4.2 or 4.23?

4.20
4.23
same same different

Since 3 is bigger than 0, 4.23 is the larger number.

Reminders for Adding Fractions and Decimals:

Fractions: If the denominators are the same, then they stay the same and you just add the numerators straight across. If the top ends up being bigger than the bottom then you must divide.

Example: $\frac{3}{5} + \frac{4}{5} = \frac{7}{5}$

$$5\overline{)7}\quad 1\ \text{r}\ 2$$

So the final answer would be $1\frac{2}{5}$

Decimals: When adding decimals you MUST LINE UP THE DECIMAL POINTS before adding. Once the decimal points are lined up, then you just add normally.

Example: 7.9 + 3

$$\begin{array}{r} 7.9 \\ +3.0 \\ \hline 10.9 \end{array}$$

Reminders for Subtracting Fractions and Decimals:

Fractions: If the denominators are the same, then they stay the same and you just subtract the numerators straight across. If the first numerator is less than the second, then you must borrow from the whole number in order to regroup and then subtract.

Example: $2\frac{3}{5} - \frac{4}{5} =$

Step 1: You cannot complete 3-4 so you must borrow 1 whole from the whole number in order to regroup and subtract. Cross out the 2 and change it to a 1

$1\ \cancel{2}\frac{3}{5} - \frac{4}{5} =$

Step 2: Add the amount on the denominator to the numerator. So 5 +3=8

$1\ \cancel{2}\frac{8}{5} - \frac{4}{5} =$

Step 3: Now you are able to subtract the tops

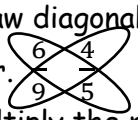
$1\ \cancel{2}\frac{8}{5} - \frac{4}{5} = 1\ \frac{4}{5}$

*Lesson 7--Equivalent Fractions or Decimals--Helpful Hints

*In this lesson students reviewed strategies for comparing fractions with unlike numerators and denominators. They also reviewed strategies for adding and subtracting fractions with unlike denominators.

Example: Compare $\frac{6}{9}$ and $\frac{4}{5}$ Students have learned a few different strategies for comparing fractions. The Butterfly Method is outlined below.

Strategy: The Butterfly Method.

Step 1: Draw diagonal circles around the numerator of one fraction and the denominator of the other. 

Step 2: Multiply the numbers in the circle and place their products at the top of each circle.

$$\overset{30}{\frac{6}{9}} \quad \overset{36}{\frac{4}{5}}$$

Step 3: The fraction that is closest to the larger number is the larger fraction. So in this example $\frac{4}{5}$ is the larger fraction.

Example: Adding and Subtracting Fractions $\frac{4}{5} + \frac{1}{10}$ or $\frac{4}{5} - \frac{1}{10}$

Step 1: In this lesson, students will be able to multiply the smaller denominator by a number in order to get to the bigger denominator so that both fractions will not have to be changed.

$\frac{4}{5}\times\frac{2}{2} + \frac{1}{10}$ $\frac{4}{5}\times\frac{2}{2} - \frac{1}{10}$

Step 2: Multiply the first fraction so that the denominators on both fractions are the same!

$\frac{8}{10} + \frac{1}{10} = \frac{\ }{10}$ $\frac{8}{10} - \frac{1}{10} = \frac{\ }{10}$

Step 3: Add or subtract the numerators and reduce if necessary.

$\frac{8}{10} + \frac{1}{10} = \frac{9}{10}$ $\frac{8}{10} - \frac{1}{10} = \frac{7}{10}$

*Reminder: On tonight's homework, you should only have to change 1 fraction to make the denominators the same. Ask yourself "is there something I can multiply the smaller denominator by in order to make it equal the bigger denominator?

*Lesson 8-- Finding a Common Unit Fraction--Helpful Hints

*In this lesson students reviewed strategies for comparing fractions with unlike numerators and denominators. They also reviewed strategies for adding and subtracting fractions with unlike denominators. For helpful hints about comparing fractions, refer to previous parts of this guide (comparing strategies were explained in lesson 6 and 7)

Example: Adding and Subtracting Fractions $\frac{4}{5} + \frac{1}{3}$ or $\frac{4}{5} - \frac{1}{3}$

Step 1: If the denominators are not the same, then they must be made the same (students have learned many different strategies for doing this) shown below is the strategy of multiplying the denominators together to make common denominators. Remember the phrase "anything you do to the bottom of a fraction must be done to the top" and make sure to also multiply the numerators.

$\frac{4}{5}\frac{x3}{x3} + \frac{1}{3}\frac{x5}{x5}$ $\qquad$ $\frac{4}{5}\frac{x3}{x3} - \frac{1}{3}\frac{x5}{x5}$

Step 2: Once the denominators are the same, then they stay the same!!

$\frac{12}{15} + \frac{5}{15} = \frac{\quad}{15}$ $\qquad$ $\frac{12}{15} - \frac{5}{15} = \frac{\quad}{15}$

Step 3: Add or subtract the numerators and reduce if necessary. $\frac{17}{15}$ would need to be divided in order to be shown as a mixed number instead of an improper fraction

$\frac{12}{15} + \frac{5}{15} = \frac{17}{15}$ $\qquad$ $\frac{12}{15} - \frac{5}{15} = \frac{7}{15}$

*Lesson 9--Mixed Problem Solving--Helpful Hints

*In today's lesson, students are continuing to review and practice comparing, adding and subtracting fractions and decimals. Previous parts of this guide can be used for helpful hints on tonight's homework problems. However, below are some other strategies for finding common denominators that students have learned in class.

*Common Denominators can be found multiple ways. First you must decide what type of connection the denominators have, then we can use strategies to make them the same:

1. One denominator is the factor of the other. Such as 9 and 18 in this example. $\frac{6}{9} - \frac{4}{18}$

   *To make these denominators the same, the best strategy would be to take the smaller denominator (9) and multiply it by a number to make 18. This would cause you to only have to change 1 fraction instead of both! ☺

2. The denominators have no common factors other than 1. Such as 5 and 3 in $\frac{2}{5} + \frac{1}{3}$

   *To make these denominators the same, the best strategy would be to multiply the denominators by each other. Don't forget the rule, "whatever you do to the bottom, you must do to the top!"

3. The denominators have a common factor that is not one of the numbers and is not 1. Such as 4 and 6 in this example. $\frac{2}{4} + \frac{1}{6}$

   *To make these denominators the same, the best strategy is to find the least common multiple. To do this you must list out the multiples of 4 and the multiples of 6 and then find the smallest multiple that they have in common.

   4: 4, 8, (12), 16, 20, (24)

   6: 6, (12), 18, (24), 30, 36

   *12 and 24 are both multiples they have in common but 12 is the smallest. So you must make each denominator in the original problem equal to 12.

*Lesson 10--Multiplying with Fractions--Helpful Hints

*In today's lesson students will review and learn strategies for multiplying fractions. The steps for multiplying a fraction by a fraction, a fraction by a whole number and multiplying with a mixed number is shown below.

Example: Multiplying a fraction and a whole number-- $\frac{1}{8} \times 24$

Step 1: Make 24 a fraction by placing the whole number 24 over a denominator of 1.

$\frac{1}{8} \times \frac{24}{1}$

Step 2: Multiply across. Numerator times numerator and denominator times denominator.

$\frac{24}{8}$

Step 3: When a fraction is larger on the top, this is called an improper fraction. Improper fractions must be changed to be whole numbers, mixed numbers or proper fractions. To do this take the numerator and divide it by the denominator. 24 ÷8 =3

Step 4: Record answer $\frac{1}{8} \times \frac{24}{1} = 3$

Example: Multiplying a fraction by a fraction-- $\frac{2}{3} \times \frac{3}{4}$

Step 1: Multiply straight across (numerator by numerator and denominator by denominator)

$\frac{2}{3} \times \frac{3}{4} = \frac{6}{12}$ **or** $\frac{1}{2}$

Example: Multiplying with a mixed number-- $\frac{1}{2} \times 2\frac{3}{5}$

Step 1: Before you can multiply, the mixed number must be changed into an improper fraction. To do this, you must take the denominator and multiply it by the whole number. Once you have that answer, you add the numerator and put the sum over the same denominator that you started with.

$2\overset{+3}{\underset{\times 5}{}}$ so... 2x5=10 and 10+3=13 so $2\frac{3}{5}$ as an improper fraction is $\frac{13}{5}$

Step 2: Multiply the two fractions straight across $\frac{1}{2} \times \frac{13}{5} = \frac{13}{10}$

Step 3: Reduce the fraction by dividing the numerator by the denominator 13÷10= $1\frac{3}{10}$

*Note: If there are 2 mixed numbers that must be multiplied together, than you must change each mixed number into an improper fraction (step 1) before multiplying (step 2)

*Another strategy that students will review while multiplying fractions is reducing before multiplying. This is outlined below:

Example: Simplify before multiplying $\frac{4}{7} \times \frac{14}{16}$

Step 1: Look at the numbers that are diagonal from one another. $\frac{4}{7} \times \frac{14}{16}$ so 4 and 16 and 7 and 14.

Step 2: Decide if you can simplify the pairs of numbers identified in step 1. One way to think about this is to ask yourself if there is something that can be "pulled out of" 4 and 16 evenly. A 4 can be "pulled out of" a 4 evenly to get 1 and out of a 16 evenly to get 4. Then change each number accordingly as shown $\frac{1\cancel{4}}{7} \times \frac{14}{\cancel{16}_{4}}$

Step 3: Do the same for the second pair of numbers if possible. 7 can be "pulled out of" 7 and 14 evenly to get 1 and 2. Change the numbers accordingly as shown. $\frac{4}{\cancel{7}_{1}} \times \frac{\cancel{14}^{2}}{16}$

Step 4: Multiply across with the new numbers

$\frac{1}{1} \times \frac{2}{4} = \frac{2}{4}$

*Note: It is possible that one or both fractions will not be able to be reduced before you multiply. This strategy is taught in order to provide students with a strategy to make the numbers smaller before multiplying if possible.

*Lesson 11-Dividing with Fractions and Whole Numbers--Helpful Hints

*Students learn how to divide fractions and make connections about how dividing fractions is actually multiplying as well. The strategy that students learn for dividing fractions is Keep, Change, Flip and is outlined below.

Example 1: 3 ÷ 4

Step 1:"KEEP" is the first step in the Keep, Change, Flip strategy and it means to KEEP the first fraction exactly how it is... $\frac{3}{1}$

Step 2:"CHANGE" is the second step in the Keep, Change, Flip strategy and it means to CHANGE the division symbol to a multiplication symbol so... $\frac{3}{1} \times$

Step 3:"FLIP" is the third step in the Keep, Change, Flip strategy and it means to FLIP the second fraction around to cause the denominator to now be the numerator and the numerator to now be the denominator. So $\frac{4}{1}$ will change to $\frac{1}{4}$

Step 3: Once you have completed the Keep, Change, Flip process you can solve.

Step 4: Solve and reduce if necessary $\frac{3}{1} \times \frac{1}{4} = \frac{3}{4}$

***Note:** Anytime that there is a whole number in a division problem with a fraction make sure to show the whole number as a fraction by placing a 1 as the denominator before you start the Keep, Change, Flip process.

Example 2: $\frac{5}{7} \div \frac{2}{5}$

Step 1:"KEEP" is the first step in the Keep, Change, Flip strategy and it means to KEEP the first fraction exactly how it is... $\frac{5}{7}$

Step 2:"CHANGE" is the second step in the Keep, Change, Flip strategy and it means to CHANGE the division symbol to a multiplication symbol so... $\frac{5}{7} \times$

Step 3:"FLIP" is the third step in the Keep, Change, Flip strategy and it means to FLIP the second fraction around to cause the denominator to now be the numerator and the numerator to now be the denominator. So $\frac{2}{5}$ will change to $\frac{5}{2}$

Step 3: Once you have completed the Keep, Change, Flip process you can solve.

Step 4: Solve and reduce if necessary $\frac{5}{7} \times \frac{5}{2} = \frac{25}{14}$ so $\frac{25}{14}$ would have to be divided since it is improper.

*Lesson 12--Is it Multiplying or Dividing?--Helpful Hints

*Today students will use what they know about multiplication and division of fractions and apply that knowledge to decide whether to multiply or divide on different problems. Please use the other sections of this guide to help your student with the lesson 12 homework assignment.

*Lesson 13--Dividing Numerators and Denominators--Helpful Hints

*Today students learned how to use the inverse (opposite) operation in order to solve problems and understand the relationship between multiplication and division more deeply. Each of the strategies that students learned in class are described below:

Example: Find the unknown factor in each equation. Then rewrite the multiplication as a division equation.

Multiplication Equation	Related Division Equation
$\frac{1}{4} \times \_\_ = \frac{4}{24}$ the missing fraction is $\frac{4}{6}$	$\frac{4}{24} \div \frac{1}{4} = \_\_$ the missing fraction is $\frac{4}{6}$

*To find the missing fraction, just ask yourself "1 times what gives me 4 and 4 times what gives me 24"

Example: $\frac{12}{20} \div \frac{4}{5} = \_\_$

Step 1: Use the inverse operation, multiplication to solve the division problem.

$\frac{4}{5} \times \_\_ = \frac{12}{20}$

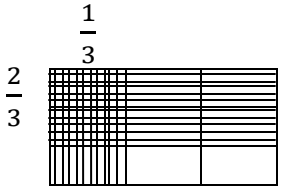
Step 2: Ask yourself "4 times what gives me 12 and 5 times what gives me 20?"

$\frac{4}{5} \times \frac{3}{4} = \frac{12}{20}$

Example: Draw a diagram, write an equation and solve the following problem. I have a picture frame with an area of $\frac{2}{9}$ square inches and a length of $\frac{1}{3}$ inches. What is the width of the picture frame?

Equation: $\frac{1}{3} \times \_\_ = \frac{2}{9}$ 1 times 2 gives me 2 and 3 times 3 gives me 9.

Diagram:



In order to show that 2 squares are covered out of 9 to represent $\frac{2}{9}$ we would have to shade in $\frac{2}{3}$ and $\frac{1}{3}$ to represent that $\frac{2}{3} \times \frac{1}{3} = \frac{2}{9}$

Solution: The width is $\frac{2}{3}$

*Lesson 14--Dividing by Unsimplifying--Helpful Hints

*Today students learned and reviewed 2 strategies for dividing fractions. The first strategy was to divide by unsimplifying and the second strategy was to multiply by the reciprocal (inverse operation.) Both strategies are outlined below:

Strategy 1: Dividing by Unsimplifying (just like part 1 of problem 9 on student homework)

$$\frac{8}{15} \div \frac{3}{5} = \frac{8}{15} \times \frac{3}{3} \div \frac{3}{5} = \frac{8}{15} \overset{\times 3}{\underset{\times 3}{}} \div \frac{3}{5} = \frac{8}{3} \times \frac{1}{3} = \frac{8}{9}$$

3 ÷ 3= 1

15 ÷ 5= 3

Strategy 1: Dividing by the Reciprocal (just like part 2 of problem 9 on student homework)

$\frac{8}{15} \div \frac{3}{5}$

Step 1:"KEEP" is the first step in the Keep, Change, Flip strategy and it means to KEEP the first fraction exactly how it is... $\frac{8}{15}$

Step 2:"CHANGE" is the second step in the Keep, Change, Flip strategy and it means to CHANGE the division symbol to a multiplication symbol so... $\frac{8}{15}$ X

Step 3:"FLIP" is the third step in the Keep, Change, Flip strategy and it means to FLIP the second fraction around to cause the denominator to now be the numerator and the numerator to now be the denominator. So $\frac{3}{5}$ will change to $\frac{5}{3}$

Step 3: Once you have completed the Keep, Change, Flip process you can solve.

Step 4: Solve and reduce if necessary $\frac{8}{15}$ X $\frac{5}{3}$ = $\frac{40}{45}$ and then $\frac{40}{45}$ would have to be reduced.

Step 5: Reduce $\frac{40}{45}$ by looking for the largest number that can be pulled out of both numbers evenly. In this example 5 can be pulled out of both for a reduced answer of $\frac{8}{9}$.

*Lesson 15--Dividing by Multiplying by the Reciprocal--Helpful Hints

*Today students practiced dividing fractions by multiplying by the reciprocal. This has been outlined in multiple sections of this guide. Please use the other sections of this guide to help your student with the lesson 15 homework assignment.

*Lesson 16--Is it Multiplying or Dividing?--Helpful Hints

*Today students will use what they know about multiplication and division of fractions and apply that knowledge in order to decide whether they should multiply or divide based off of the situation described in the word problem. Please use the other sections of this guide to help your student with these types of questions on their lesson 16 homework assignment.

*Today students also learned strategies for making generalizations and predictions about fraction operations. Those reminders are outlined below:

*Multiplying a number *n* by a fraction less than 1 gives us a product less than *n.*

*Multiplying a number *n* by a fraction greater than 1 gives us a product greater than *n.*

*Dividing a number *n* by a fraction less than 1 gives us a quotient greater than *n.*

*Dividing a number *n* by a fraction greater than 1 gives us a quotient less than *n.*

*Lesson 17--Mixed Practice with Fractions and Decimals--Helpful Hints

*Today students will participate in a mixed review of all fraction and decimal operations that they have learned in Unit 3. All of the operations that they will encounter are outlined in other sections of this guide. Please use the other sections of this guide to help your student with the lesson 17 homework assignment.