

4B Multiplying and Dividing Fractions.doc

Prealgebra

Name: _____

Due Date: _____

WHY: The most common applications of fractions are multiplying and dividing. (Example: “All sale items are $\frac{1}{3}$ off.”) Multiplying and dividing fractions is also the basis for solving proportional-reasoning problems, which we will do in a few days.

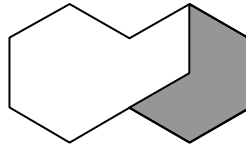
Learning Objectives:

- 1) Convert fractions between various representations, such as pictures, decimals, and percents, and expressions.
- 2) Estimate products and quotients involving fractions.
- 3) Explain multiplying and dividing fractions in various representations, such as stories, pictures, and arithmetic with fractions, decimals, and percents.

Warm-up (no calculators):

1)

- a) What fraction is represented by the shaded part of the figure?



- b) Darkly shade $\frac{1}{4}$ of the shaded part.

- c) Write the multiplication equation that your picture represents.

$$\boxed{} \times \boxed{} = \boxed{}$$

2) For the following story, draw a picture, write an expression, and write the answer.

“One-third of a pizza is the size of a serving of pizza. At the end of a party, there two and one-half pizzas are left over. How many servings is this?”

3) Write a story, draw a picture, and simplify: $\frac{1}{2} \div \frac{1}{4}$

Activity:

1) For each question, write an arithmetic expression involving fractions and evaluate it by hand. Show your work. When you evaluate the expression, you may use any representation you want (e.g. fractions, decimals, pictures, ...).

- a) One out of every two students at LMC is female.
There are 8000 students at LMC. How many female students are there at LMC?

- b) Janice’s will said to split \$30,000 evenly between her grandchildren. Janice had two grandchildren when she died. How much did each grandchild get?

- c) At Costco I bought a 400-ounce bag of rice. $\frac{1}{2}$ ounces makes one serving. How many servings will the entire bag make?

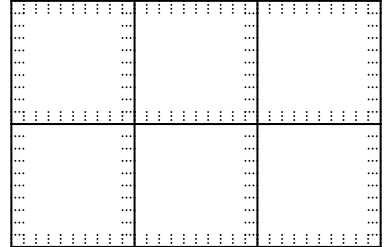
4B Multiplying and Dividing Fractions.doc

- d) According to a report from the Contra Costa Water District, a liter of tap water contains 1.5 milligrams of copper. How much copper is there in $\frac{1}{4}$ liter?
(Note: $\frac{1}{4}$ liter is about 1 cup.)

- 2) Remember that the formula for the area of a rectangle is $A = L \times W$.

a) Using the area formula, draw and shade a rectangle to represent $\frac{5}{2} \times \frac{2}{5}$. (I have provided some gridlines to help you draw.)

b) What is $\frac{5}{2} \times \frac{2}{5}$? Explain how this answer matched the number of pieces you shaded in your picture.



- 3) Solve $\frac{8}{9}x = 90$ according to the following problem-solving steps.

a) Estimate: is the solution for x more or less than 90? Explain how you know.

b) Solve: What should you do to both sides of the equation in order to isolate x ?

c) Estimate again: is $90 \div \frac{8}{9}$ more than or less than 90? Explain how you know.

d) Simplify: Calculate $90 \div \frac{8}{9}$ by hand.

e) Check division: What buttons do you push on the calculator to find $90 \div \frac{8}{9}$?

f) Check answer: Plug into the equation using your calculator. What buttons do you push?

- 4) Solve “400 is 125% of what” using the problem-solving plan of writing an equation
Write the percent as a fraction.

4B Multiplying and Dividing Fractions.doc

5) Write a story that fits each expression.

a) $\frac{3}{5}(10)$

b) $3(\frac{1}{5} \cdot 10)$

c) $\frac{3(10)}{5}$

6) In the box below are various expressions. Many of them are equivalent to others in the box. List all the groups of equivalent expressions. (Hint: start by listing all the expressions that are equivalent to $\frac{3}{4}x$). For each of your groups, explain why all the expressions in the group are equivalent. For example, your explanations could involve stories, pictures, or the order of operations.

$\frac{3}{4}x$	$x \div 3 \div 4$	$\frac{-3}{4}x$	$\approx 1.33x$	$4 \cdot x \div 3$	$\frac{3}{4} \div x$	$\frac{3}{4x}$
$x \div 3 \cdot 4$	$\frac{3x}{4}$	$\frac{4}{3}x$	$x \div \frac{3}{4}$	$\frac{-3}{-4}x$	$\frac{x}{\frac{3}{4}}$	$0.75x$

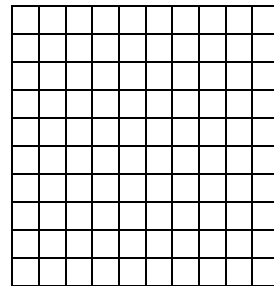
7) The grid to the right represents \$850.

a) How much does each box represent?

b) Shade 16% of the grid.

c) How much do the shaded boxes represent?

d) Write the arithmetic problem and answer that you have just represented on the grid.



8) Write a story and shade the grid to represent and evaluate $(2\frac{3}{5}) \times \$64$.

.

