

Multiplication of a Fraction by a Whole Number; Measurement

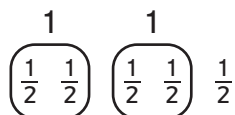
Fractions

Unit 7 begins with students applying and extending their previous understandings of multiplying whole numbers to multiplying a fraction by a whole number. Your child will multiply fractions by whole numbers in different ways: using concrete objects, drawing pictures, and writing equations. Using a variety of strategies helps students build conceptual knowledge and gives them more than one method to choose from when solving problems.

Consider this number story, for example: *Mattie needs $\frac{1}{2}$ cup of granola for each member of her family. She has 5 family members. How much granola does she need for everyone in the family?*

Below are examples of different strategies students might use to solve the problem.

- Use repeated addition: $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{5}{2}$, or $2\frac{1}{2}$ cups of granola
- Apply relational thinking: Two $\frac{1}{2}$ s are 1. Four $\frac{1}{2}$ s are two. Another $\frac{1}{2}$ is $2\frac{1}{2}$.
- Draw a picture:



- Use fraction circles:



- Use equations: $5 * \frac{1}{2} = \frac{(5 * 1)}{2} = \frac{5}{2}$

In this unit students create drawings or use models, such as fraction circles or fraction strips, to explain their thinking as they apply their skills in real-life contexts involving time, weight, capacity, and money.

Measurement

In Unit 7 students work with increasingly complex measurement conversion problems. They explore U.S. customary units of capacity, including the cup, pint, quart, and gallon, and solve number stories involving conversions between whole numbers and fractions of units.

Unit 7: Family Letter, *continued*

Students also convert between pounds and ounces in the course of solving real-world number stories involving U.S. customary units of weight. Lesson 7-12 challenges students with number stories involving decimals in a money context. Here they apply their understanding of fraction/decimal equivalencies and fraction operations to solve the problems. According to the Common Core State Standards, students are not expected to perform operations with decimals until fifth grade. However, the link established through these activities between different representations of numbers, especially fractions and decimals, is a key prerequisite concept for success with decimal computation. Problems like the ones presented in this unit build the foundation for that later work.

Line Plots

Line plots are used to organize and display data. Students analyze data measured to an eighth of a unit, create their own line plots, and use line plots to solve problems involving computations with fractions and mixed numbers.

Division

Students estimate, solve, and assess the reasonableness of answers to multistep division number stories. They plan strategies and write number models with letters for the unknown quantities, explaining how they found each answer and checking to make sure their answer makes sense. Students use division strategies to solve real-world measurement number stories, converting between different units of measurement.

Please keep this Family Letter for reference as your child works through Unit 7.

Vocabulary

Important terms in Unit 7:

line plot A sketch of data in which checkmarks, Xs, stick-on notes, or other marks above a labeled line show the frequency of each value.

mixed number A number that is written using both a *whole number* and a *fraction*. For example, $5\frac{2}{3}$ is a mixed number equal to $5 + \frac{2}{3}$.

multiple of a fraction A product of a fraction and a counting number. For example, $\frac{5}{4}$ is a multiple of $\frac{1}{4}$ because $\frac{5}{4} = 5 * \left(\frac{1}{4}\right)$.

unit fraction A fraction in which the numerator is 1. For example, $\frac{1}{4}$, $\frac{1}{6}$, and $\frac{1}{10}$ are unit fractions. Fractions can be built from unit fractions. For example, $\frac{3}{4}$ can be built from three $\frac{1}{4}$ s.

Do-Anytime Activities

To work with your child on concepts taught in this unit, try these activities:

1. Have your child make a list of shoe sizes from the members of the household and create a line plot from the data. Ask questions like these: *What is the largest shoe size? The smallest? What is the difference between the largest and smallest shoe size?*
2. Ask your child to convert weights of common items into fractions of a pound. For example, a 4-ounce tube of toothpaste = $\frac{1}{4}$ pound.

3. Ask questions like these:
- How long did it take you to get to school?
 - What fraction of an hour is that?
 - If it takes you 3 times as long to get to school tomorrow, how long will it take you?
 - How much time do you spend all week getting to school?
4. Look at a store advertisement or sale flyer and pose questions about items sold in bulk.
For example: What is the cost of 1 ____? What is the cost if we buy ____ or ____?

Building Skills through Games

In this unit your child will play the following new game to increase his or her understanding of fraction operations. For detailed instructions, see the *Student Reference Book*.

Fraction Multiplication Top-It See *Student Reference Book*, page 264. Students practice multiplying a whole number by a fraction, and they compare their answer with a partner's.

As You Help Your Child with Homework

As your child brings assignments home, it may be helpful to review the instructions together, clarifying them as necessary. The answers listed below will guide you through the Home Links in Unit 7.

Home Link 7-1

1. Answers vary. 3. Answers vary.
5. 4 pints 7. 2 pints 9. 3 quarts
11. 546 13. 4,430

Home Link 7-2

1. $\frac{7}{4}$, or $1\frac{3}{4}$ cups
3. a. $\frac{3}{6}$, or $\frac{1}{2}$ cup b. $\frac{15}{6}$, or $2\frac{3}{6}$, or $2\frac{1}{2}$ cups
5. 3,250 7. 22,104

Home Link 7-3

1. $4 * \frac{1}{5} = \frac{4}{5}, \frac{4}{5}$
3. $5 * \frac{1}{2} = \frac{5}{2}$, or $2\frac{1}{2}$; $\frac{5}{2}$, or $2\frac{1}{2}$ avocados
5. $\frac{3}{2}$, or $1\frac{1}{2}$ 7. $\frac{5}{10}$, or $\frac{1}{2}$

Home Link 7-4

1. $\frac{5}{5}$, or 1 3. $\frac{18}{6}$, or 3
5. $5 * \frac{6}{10} = \frac{30}{10}$, or 3 miles
 $7 * \frac{6}{10} = \frac{42}{10}$, or $4\frac{2}{10}$, or $4\frac{1}{5}$ miles
7. 2,096 9. 14,752

Home Link 7-5

- $5 * 1\frac{1}{2} = l$; $\frac{15}{2}$, or $7\frac{1}{2}$ pounds; 7 and 8; 120 ounces
- $14\frac{3}{6}$; 14 and 15
- $\frac{6}{4}$, or $1\frac{2}{4}$
- $\frac{3}{6}$

Home Link 7-6

- $8 * \frac{3}{8} = \frac{24}{8}$, or 3 pounds
- $4 * \frac{5}{8} \text{ lb} = \frac{20}{8}$, or $2\frac{4}{8}$ pounds
- 45 R1
- 192 R3

Home Link 7-7

- A; \$2 more per ticket; Sample answer: $276 \div 2 = 138$; $138 \div 6 = 23$; $336 \div 2 = 168$; $168 \div 8 = 21$
- 4,524
- 5,817

Home Link 7-8

- Sample answer: $(5 * 1,000) - (8 * 500) = w$; 1,000 milliliters
- Sample answer: $1,400 - (13 * 100) = p$; 100 centimeters
- $3\frac{4}{6}$
- $5\frac{2}{12}$

Home Link 7-9

- The perimeter is 4 times the side length.
- 125 toothpicks
- 251
- 31 R4

Home Link 7-10

- Yes; $\frac{5}{2}$, or $2\frac{1}{2}$ miles
 - $\frac{10}{2}$, or 5 miles; Sample answer: Tony will run $\frac{1}{2}$ mile 5 times a week. $5 * \frac{1}{2} = \frac{5}{2}$ miles. For 2 weeks, add $\frac{5}{2} + \frac{5}{2} = \frac{10}{2}$, or 5 miles. $5 > 4$.
- 321
- 147 R4

Home Link 7-11

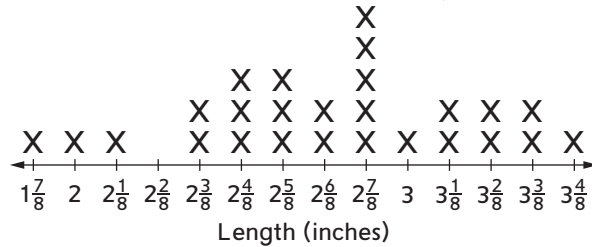
- $\frac{15}{5}$, or 3
- $1\frac{2}{4}$ pounds; 24 ounces
- 9
- 116 R2
- 42 R1

Home Link 7-12

- \$5.53; Sample answer: $7 * \frac{79}{100} = \frac{79}{100} + \frac{79}{100} + \frac{79}{100} + \frac{79}{100} + \frac{79}{100} + \frac{79}{100} + \frac{79}{100} = \frac{553}{100} = 5 \text{ and } 53 \text{ hundredths} = 5.53$
- \$1.69; Sample answer: $\frac{1,000}{100} - \frac{831}{100} = \frac{169}{100}$
- =
- >

Home Link 7-13

Pencil Lengths (to the nearest $\frac{1}{8}$ inch)



- 13 students
- 3 pencils
 - 6 inches
- $3\frac{4}{8}$ inches
 - $1\frac{7}{8}$ inches
 - $4\frac{11}{8}$, or $5\frac{3}{8}$ inches
 - $1\frac{5}{8}$ inches
- $12\frac{2}{10}$
- $3\frac{90}{100}$