NAME

DATE

TIME

Fraction and Mixed-Number Computation; Measurement

In Unit 3 students learned how to compare and order fractions and decimals. In Unit 5 they deepen their understanding by learning how a fraction such as $\frac{3}{4}$ can be broken into smaller parts, such as $\frac{1}{4} + \frac{1}{4} + \frac{1}{4}$. Based on this understanding, students are able to see how adding and subtracting fractions with like denominators is simply putting together or taking away some number of same-size parts. For example, $\frac{3}{4} - \frac{1}{4}$ can be thought of as taking away 1 of the 3 parts, or fourths, that make up the fraction $\frac{3}{4}$.

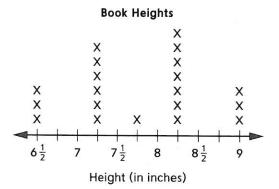
In this unit students extend this idea to adding and subtracting mixed numbers, such as $1\frac{1}{4} + 2\frac{2}{4}$. They use different fraction representations and tools, including fraction circles, number lines, and drawings, to build a concrete understanding of the meaning of fractions, as opposed to just learning rules and procedures.

Line Plots

Line plots are used to organize and display data. As you can see from the diagram, a line plot can be thought of as a rough sketch of a bar graph.

From this line plot we can learn that the tallest books are 9 inches tall and that there are 3 of them, that no books are $8\frac{3}{4}$ inches tall, and so on.

Students also create line plots with data they collect in fractional units and then use information in the plots to solve problems involving adding and subtracting fractions.



Angles: Unit Iteration and Rotations

Students begin their work with angle measurement by exploring the attribute of angle size. They begin measuring angles using a nonstandard unit—a wedge—as a way to see how measuring an angle is the same as measuring any other attribute. Iterating (or repeating) unit angles fills the spread between an angle's rays, just as iterating unit lengths fills a given length. Students discuss the need for a standard unit of measure, and they are introduced to the degree. An angle that measures 1 degree is a very small angle, which, when iterated 360 times, forms a circle.

Symmetry

Students complete symmetric figures that are partially given and create their own symmetric figures.

Multistep Multiplication Number Stories

Students continue solving multistep number stories, with a focus on multidigit multiplication strategies. They use number models that include a letter for the unknown, and they consider the reasonableness of their answers.

Please keep this Family Letter for reference as your child works through Unit 5.

use

Vocabulary

Important terms in Unit 5:

arc A part of a circle centered on the vertex of an angle. An arc is sometimes used to indicate where to measure the angle.

decompose To break apart a number or shape into smaller numbers or shapes.

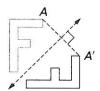
degree A unit of measure for angles based on dividing a circle into 360 equal arcs.

full-turn A 360° rotation.

half-turn A 180° rotation.

like denominator A denominator that is the same in two or more fractions. For example, the fractions $\frac{3}{8}$, $\frac{5}{8}$, and $\frac{6}{8}$ have a like denominator, which is 8.

mirror image A point, line, or figure that exactly matches another point, line, or figure when it is reflected or folded over a line of symmetry so that it comes to rest on top of the corresponding image.



Sometimes the line of reflection is called a mirror, or mirror line.

mixed number A number that is written using both a whole number and a fraction.

quarter-turn A 90° rotation.

reflex angle An angle measure that is between 180° and 360°.

rotation A change in the direction an object faces; a turn.

straight angle An angle that measures 180°.

three-quarter turn A 270° rotation.

unit fraction A fraction whose numerator is 1. For example: $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{12}$ are unit fractions.

whole The entire object, collection of objects, or quantity being considered in a problem situation: 100%.

Do-Anytime Activities

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

- Have your child help you measure when you are cooking or baking, using fractional measurements like 2 ½ cups of flour or ¼ teaspoon of salt. Ask your child how you would double the measurements to make two batches instead of one. See whether he or she can show you one or two ways to do this.
- 2. Work with your child to create a line plot showing the number of hours family members spend sleeping or engaged in some other routine activity. Ask questions about the line plot; for example: "How many people in the family sleep for 8½ hours?"
- **3.** At home or when you are out together, encourage your child to point out items he or she believes are symmetric. Ask how many lines of symmetry there are in each of these objects.
- **4.** Have your child point out angles in your home. Ask whether the angles are obtuse, acute, or right angles.

Building Skills through Games

In this unit, your child will play the following games as a way to increase his or her understanding of adding and subtracting fractions and mixed numbers, as well as angles, symmetry, and multistep multiplication number stories. For detailed instructions, see the *Student Reference Book*.

Decimal Top-It See **Student Reference Book**, page 253. This game provides practice comparing, ordering, reading, and identifying the values of digits in decimal numbers.

Fishing for Fractions (Addition/Subtraction)
See Student Reference Book, page 260. In this game students practice adding together two like fractions or subtracting one like fraction from another.

Fraction/Decimal Concentration See **Student Reference Book**, page 262. This game helps students recognize when fractions and decimals are equivalent.

Fraction Match See **Student Reference Book**, page 263. This game develops skill in naming equivalent fractions.

Fraction Top-It See **Student Reference Book**, page 265. This game develops skill in comparing fractions.

As You Help Your Child with Homework

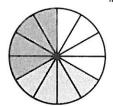
As your child brings assignments home, it may be helpful to review the instructions together, clarifying them as necessary. The answers listed below will quide you through some of the Home Links in Unit 5.

Home Link 5-1

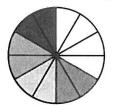
1. Sample answers:

Sample diswers.
$$\frac{1}{5} + \frac{1}{5} + \frac{1}{5}$$

 $1+1+\frac{1}{5}$; $\frac{2}{5}+\frac{3}{5}+\frac{6}{5}$ **3. a.** Sample answer: $\frac{4}{12} + \frac{4}{12} = \frac{8}{12}$;



b. Sample answer: $\frac{8}{12} = \frac{2}{12} + \frac{2}{12} + \frac{2}{12} + \frac{2}{12}$



- **5**. 3,227
- **7.** 1,950

Home Link 5-2

- 1. a.

c.

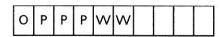




- d.
- 5. 4

Home Link 5-3

- 1. a. Whole new trees
 - **b.** Sample answer: $\frac{1}{10} + \frac{3}{10} + \frac{2}{10} = t$
 - c. Sample answer:



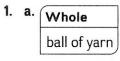
- **d.** $\frac{6}{10}$ oak, willow, or pine

5. $\frac{10}{6}$, or $1\frac{4}{6}$

7. 0.4

9. 0.6

Home Link 5-4



- **b.** Sample answer: $6\frac{2}{3} + 2\frac{2}{3} = s$
- c. Sample answer: I decomposed the mixed numbers. Then I combined the wholes and the fractions. $6 + \frac{2}{3} + 2 + \frac{2}{3} = 8 + \frac{4}{3} = 9\frac{1}{3}$
- **d.** $9\frac{1}{3}$, or $\frac{28}{3}$, balls
- 3. $8\frac{3}{6}$, or $\frac{51}{6}$
- **5.** $6\frac{2}{4}$, or $\frac{26}{4}$ **7.** 5,022
- 9. 1.092

Home Link 5-5

- 1. 20 hundredths + 15 hundredths = 35 hundredths
- 3. $\frac{10}{100} + \frac{50}{100} = \frac{60}{100}$, or $\frac{1}{10} + \frac{5}{10} = \frac{6}{10}$
- **5.** $1 + \frac{30}{100} + 5 + \frac{64}{100} = 6\frac{94}{100}$
- 7. $\frac{150}{100} + \frac{78}{100} = \frac{228}{100}$, or $2\frac{28}{100}$ 9. $\frac{2}{4}, \frac{3}{6}, \frac{4}{8}$ 11. $\frac{2}{8}, \frac{3}{12}, \frac{4}{16}$

Home Link 5-6

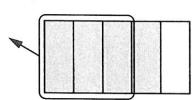
- 1. Sample answer: Bill and Carl didn't get $\frac{1}{5}$. They each got $\frac{1}{8}$. I know this because the two triangles are in $\frac{1}{4}$ of the whole land, so each is half of a fourth, or $\frac{1}{8}$.
- **3.** 15,732
- **5.** 10,591

Home Link 5-7

1. a. Whole

Elijah's allowance

- **b.** Sample answer: $\frac{4}{5} \frac{3}{5} = a$
- c. Sample answer:



- **d.** $\frac{1}{5}$ of his allowance

- 7. 2,243
- 9. 17,437

Home Link 5-8

- 1. a. Whole
 - **b.** Sample answer: $3\frac{1}{3} 1\frac{2}{3} = c$

c. Sample answer: I started with what we had and counted up to what we needed. $1\frac{2}{3} + \frac{1}{3} = 2.2 + 1\frac{1}{3} = 3\frac{1}{3}$. Then I added:

$$1\frac{2}{3} + \frac{1}{3} = 2.2 + 1\frac{1}{3} = 3\frac{1}{3}$$
. Then I adde $\frac{1}{3} + 1\frac{1}{3} = 1\frac{2}{3}$.

- **d.** $1\frac{2}{3}$, or $\frac{5}{3}$, cups

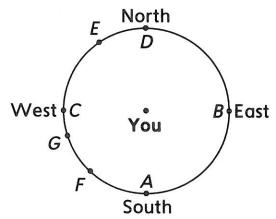
- **5.** $2\frac{3}{5}$, or $\frac{13}{5}$ **9.** 8,084
- 7. 540

Home Link 5-9

- Inches Grown in 1 Year Growth (inches)
- 3. $3\frac{1}{2} \frac{1}{2} = d$; 3 inches

Home Link 5-10

1-6. E, F, and G are sample answers



- **7.** 4,250
- 9. 2,388

Home Link 5-11

1. angle A

3. angle *E*

5. angle A or B

7. 146,388

9. 12,961

Home Link 5-12

1. a. Triangle b. 2 sides c. 2 angles d. No.

3. 9

5. 6

7. 9

Home Link 5-13

1. Sample answer: 3 * (8 * 2 * 42) = p; Sample answer: 3 * 800 = \$2,400; \$2,016, or 2,016 dollars

3. 9

5. 6

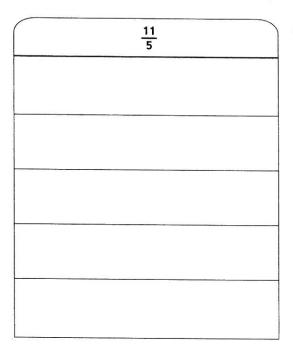
7. 36

Family Note In class today your child learned to decompose fractions into smaller parts. For example, $\frac{5}{6}$ can be decomposed into $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{3}{6} + \frac{3}{6} + \frac{4}{6}$, and so on.

Complete the name-collection boxes using equations.

SRB 125-127

1



(2)

| 1 3/8 |
|-------|
| |
| |
| |
| |
| |
| |

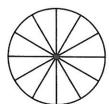
3 Decompose $\frac{8}{12}$ in more than one way into a sum of fractions with the same denominator.

Record each decomposition with an equation and justify it by shading the circle.

a. Equation:



Equation: _



Practice

4) 9 * 785 = _____

(5) 461 * 7 = _____

6) 644 * 4 = _____

(7) _____ = 39 * 50

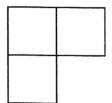
What Is the Whole?

For Problems 1-3, use your Geometry Template or sketch the shapes.



- is $\frac{1}{4}$. Draw each of the following: Suppose
- Example: $\frac{3}{4}$
- **a.** 1 **b.** $1\frac{1}{2}$

c. 2



- > is $\frac{2}{3}$. Draw each of the following: 2 Suppose <
- **b.** 1 **c.** $\frac{4}{3}$

d. 2

- 3 Suppose $\sqrt{ }$ is $\frac{1}{3}$. Draw each of the following:
 - **a.** $\frac{3}{3}$

2

d. $1\frac{1}{3}$

- $\frac{4}{5} = \frac{8}{5}$
- $\boxed{5} \quad \frac{3}{10} = \frac{q}{12} \qquad \qquad \boxed{6} \quad \frac{q}{10} = \frac{100}{100}$

Adding Fractions

Solve the number stories. Use a different strategy for each one.



- The park department wants to have new trees planted. They agreed that $\frac{1}{10}$ of the trees will be oak, $\frac{3}{10}$ will be pine, and $\frac{2}{10}$ will be willow. They are undecided about the rest. What fraction of the trees will be oak, willow, or pine?
 - Fill in the whole box.

Whole

Number model with unknown:

One way to solve a fraction addition problem:

- Answer (with unit):
- The Patels have a DVD collection. Three-eighths of the DVDs are animated. Two-eighths of them are mysteries. One-eighth are comedies. The rest are about travel. What fraction of the DVDs are not about travel?
 - Fill in the whole box.

Number model with unknown:

Whole

- A different way to solve a fraction addition problem: C.
- Answer (with unit): _____

Add.

$$\frac{2}{5} + \frac{1}{5} = \underline{}$$

$$\boxed{5} \quad \frac{5}{6} + \frac{5}{6} = \underline{}$$

Practice

Represent the fractions as decimals.

$$9 \quad \frac{4}{10} =$$
 $0 \quad \frac{6}{100} =$ $0 \quad \frac{6}{100} =$

$$\frac{6}{100} =$$

Mixed-Number Addition

Solve the number stories. Use a different strategy for each one.



- The art class had a box filled with balls of yarn. The students used $6\frac{2}{3}$ balls for a project. There are now $2\frac{2}{3}$ balls left in the box. How many balls of yarn did the art class start with?
 - Fill in the whole box.

Whole

Number model with unknown:

One way to solve a mixed-number addition problem:

- Answer (with unit): _____
- Mrs. Meyers is growing vines along the sides of her house. On the west side the vines are $2\frac{4}{10}$ meters tall. On the east side the vines are $5\frac{8}{10}$ meters taller than the ones on the west side. How tall are the vines on the east side?
 - Fill in the whole box.

Number model with unknown:

Whole

- A different way to solve a mixed-number addition problem:
- Answer (with unit): _____

Add. Show your work.

$$\boxed{3} \quad 5\frac{2}{6} + 3\frac{1}{6} = \underline{}$$

$$3\frac{3}{4} + 2\frac{3}{4} =$$

(5)
$$3\frac{3}{4} + 2\frac{3}{4} =$$
 (6) $3\frac{2}{5} + 1\frac{4}{5} + 2\frac{3}{5} =$

Adding Tenths and Hundredths

Use what you know about equivalent fractions to add. Write an equation to show your work.



(1) 2 tenths + 15 hundredths

Equation (in words): _____

 $\frac{68}{100} + \frac{3}{10}$

Equation: _____

 $\frac{1}{10} + \frac{50}{100}$

Equation: _____

Equation: _____

 $\boxed{5} \quad 1\frac{3}{10} + 5\frac{64}{100}$

Equation: _____

Equation: _____

 $\frac{15}{10} + \frac{78}{100}$

Equation:

8 Nicholas shaded $\frac{40}{100}$ of his hundreds grid. Victor shaded $\frac{5}{10}$ of his grid.

Who shaded more? _____

How much did they shade in all? _____ of a grid

Practice

Write three equivalent fractions.

 $9 \frac{1}{2} =$

 $\frac{1}{3} =$

 $\frac{1}{5} =$

Fraction Error Finder

Consider this problem:

A king owns land outside of his castle.

He has partitioned the land to give as gifts to his 5 sons.



What fraction of the land did the king give to each of his sons?

Here is Zeke's solution:

Andy got
$$\frac{1}{2}$$

Bill got
$$\frac{1}{5}$$

Carl got
$$\frac{1}{5}$$

Dirk got
$$\frac{1}{8}$$

Bill got
$$\frac{1}{5}$$

Evan got $\frac{1}{8}$

Identify Zeke's two errors, correct them, and explain why your answer is correct.

Write a fraction addition equation to represent the correct answers and show the sum of the pieces of land.

Practice

Use U.S. traditional addition and subtraction.

Subtracting Fractions

Solve the number stories. Use a different strategy for each one.



- Elijah still had $\frac{4}{5}$ of his allowance at the end of the month. Then he spent $\frac{3}{5}$ of his original allowance on a movie ticket and popcorn. How much of Elijah's allowance was left?
 - Whole Fill in the whole box.
 - Number model with unknown: _____
 - One way to solve a fraction subtraction problem: C.
 - Answer (with unit):
- Kendra's computer battery had $\frac{q}{10}$ of a charge. After her sister Lydia borrowed the computer, the battery had $\frac{3}{10}$ of a charge left. How much of the battery charge did Ludia use?

Whole Fill in the whole box.

- b. Number model with unknown: _____
- Another way to solve a fraction subtraction problem.
- Answer (with unit): _____

Subtract.

(3)
$$\frac{2}{2} - \frac{1}{2} =$$
 (4) $\frac{11}{6} - \frac{4}{6} =$ (5) $= 1 - \frac{1}{5}$

$$\boxed{4} \quad \frac{11}{6} - \frac{4}{6} = \underline{}$$

$$\boxed{5} \quad \underline{\qquad} = 1 - \frac{1}{5}$$

Mixed-Number Subtraction

Solve the number stories. Use a different strategy for each one.

1 The chocolate chip cake recipe calls for $3\frac{1}{3}$ cups of milk. We only have $1\frac{2}{3}$ cups at home. How much more milk do we need?

Whole SRB

- a. Fill in the whole box.
- **b.** Number model with unknown; _____
- **c.** One way to solve a mixed-number subtraction problem:
- d. Answer (with unit):
- Lourdes is listening to an audio book that is 9 hours long. She has listened for $6\frac{1}{6}$ hours so far. How many hours of listening time are left?



- a. Fill in the whole box.
- **b.** Number model with unknown:
- c. A different way to solve a mixed-number subtraction problem:
- d. Answer (with unit): _____

Subtract. Show your work.

Student Growth

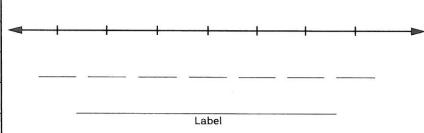
Mrs. Welch surveyed her students about how much they had grown over the past year. This is the data she gathered.



| Student Growth Over the Past Year | | | | |
|---|---------------------------------|--|--|--|
| (to the nearest $\frac{1}{2}$ inch) | | | | |
| 1 1 2 | $1\frac{1}{2}$ $2\frac{1}{2}$ 2 | | | |
| 2 | $2\frac{1}{2}$ | | | |
| $2\frac{1}{2}$ | 2 | | | |
| 1/2 | $1\frac{1}{2}$ | | | |
| $ \begin{array}{c} 2 \\ 2\frac{1}{2} \\ \frac{1}{2} \\ 2\frac{1}{2} \end{array} $ | $1\frac{1}{2}$ $\frac{1}{2}$ 2 | | | |
| 1 | 2 | | | |
| $1\frac{1}{2}$ | 2 | | | |
| $1\frac{1}{2}$ $1\frac{1}{2}$ $3\frac{1}{2}$ | $\frac{1}{2}$ $1\frac{1}{2}$ | | | |
| $3\frac{1}{2}$ | 1 1 2 | | | |
| 1 | 1 | | | |
| 1 | 2 1 / ₂ | | | |
| 2 | | | | |
| 21/2 | $1\frac{1}{2}$ | | | |

1 Plot the data set on the line plot.

Title



Use the completed line plot to answer the questions.

2 What is the greatest number of inches a student grew in a year?

About _____ inch(es)

The least? About _____ inch(es)

What is the difference between the greatest and the least number of inches grown?

Number model with unknown: _____

Answer: _____ inch(es)

Practice

Circle the three equivalent fractions in each group.

 $4 \quad \frac{1}{4}, \frac{3}{6}, \frac{1}{8}, \frac{2}{8}, \frac{3}{12}$

 $\frac{3}{4}, \frac{4}{8}, \frac{6}{8}, \frac{5}{6}, \frac{3}{1}$

6 $\frac{2}{3}$, $\frac{1}{5}$, $\frac{4}{6}$, $\frac{7}{12}$, $\frac{8}{12}$

 $\frac{1}{2}$, $\frac{5}{10}$, $\frac{4}{8}$, $\frac{7}{12}$

Rotations

Family Note If your child needs help with the following problems, consider putting up signs in a room in your home to indicate the directions *north, south, east,* and *west.* Do the turns with your child.

left turn right turn counterclockwise clockwise

Please return this Home Link to school tomorrow.

Make the turns described below. Show which way you face after each turn by:

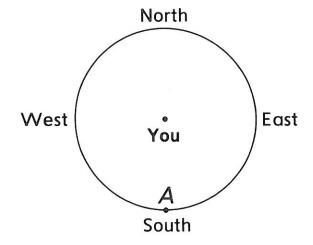


- · Drawing a dot on the circle.
- · Labeling the dot with a letter.

Example: Face north.

Do a $\frac{1}{2}$ turn counterclockwise.

On the circle, mark the direction you are facing with the letter A.



- 1 Face north. Do a $\frac{1}{4}$ turn clockwise. Mark the direction you are facing with the letter B.
- 3 Face east. Do a $\frac{1}{4}$ turn counterclockwise. Mark the direction you are facing with the letter D.
- (5) Face north. Make a clockwise turn that (6) is more than a $\frac{1}{2}$ turn but less than a $\frac{3}{4}$ turn. Mark the direction you are facing with the letter F.
- Face north. Do a $\frac{3}{4}$ turn clockwise. Mark the direction you are facing with the letter C.
- Face west. Make less than a $\frac{1}{4}$ turn clockwise. Mark the direction you are facing with the letter E.
- Face north. Make a counterclockwise turn that is less than a $\frac{1}{2}$ turn but more than a $\frac{1}{4}$ turn. Mark the direction you are facing with the letter G.

Practice

7) 85 * 50 = _____

(8) 416 * 6 = _____

9 _____ = 597 * 4

1,373 * 7 = _____

Estimating Angle Measures

Rotation

 $\frac{1}{4}$ turn

full turn

Family Note Our class has been learning about turns, angles, and angle measures. A full turn can be represented by an angle of 360°, a $\frac{1}{2}$ turn by an angle of 180°, a $\frac{1}{4}$ turn by an angle of 90°, and so on. Help your child match the measures below with the angles pictured. (It is not necessary to measure the angles with a protractor.)

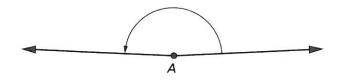
Name which angle has the given measure.

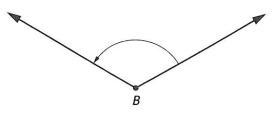
- (1) about 180°
- angle
- about 90°

- angle
- about 270°
- angle
- between 0° and 90°
- angle
- (5) between 90° and 180° angle

| e | $\frac{1}{2}$ turn | 180° |
|---|--------------------|------------------------|
| e | 3/4 turn | 270° |
| | | Annual of constitution |



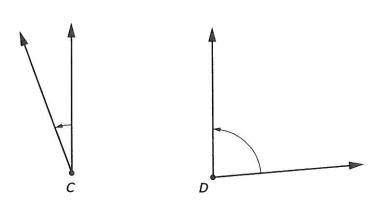


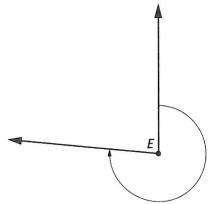


Degrees

90°

360°





- 5,956 + 4,983 = _____
- 60,351 + 86,037 =
- 41,015 517 = _____
- 23,730 10,769 = _____

Folding Shapes

Family Note Our class has been studying lines of symmetry—lines that divide figures into mirror images. Help your child look for symmetric shapes in books, newspapers, and magazines, and in objects around the house, such as windows, furniture, dishes, and so on.

Please bring your cutouts to school tomorrow.

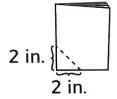
1 Fold a sheet of paper in half. Cut off the folded corner, as shown. Before you unfold the cutoff piece, guess its shape.



a. Unfold the cutoff piece. What shape is it?



- **b.** How many sides of the cutoff piece are the same length? _____ sides
- c. How many angles are the same size? _____ angles
- d. The fold is a line of symmetry. Does the cutoff piece have any other lines of symmetry?
- 2 Fold another sheet of paper in half. Fold it in half again. Make a mark on both folded edges 2 inches from the folded corner. Cut off the folded corner. Before you unfold the cutoff piece, guess its shape.



- a. Unfold the cutoff piece. What shape is it? _____
- **b.** Are there any other lines of symmetry besides the fold lines?
- **c.** On the back of this paper, draw a picture of the cutoff shape. Draw all of its lines of symmetry.

Expressing Answers to Number Stories

Family Note Today students learned to express solutions to multistep number stories using correct units and single number models. Have your child explain the steps for solving each of the problems below, and then help him or her write these steps as a single number model, including a letter for the unknown quantity.

Solve. Record a long number model with a letter for the unknown quantity and write the answer with the correct unit.



(1)Guillermo hires two painters to paint the walls of his living room. The painters each make \$42 an hour for an 8-hour workday. If the work takes 3 days, how much will Guillermo pay the painters?

Number model with unknown:

Estimate:

Answer (with unit):

Blaine is on vacation in New York City and wants to collect magnets of places he visits to give to all his friends. The Times Square magnets cost \$2 each and come in sets of 4. The Statue of Liberty magnets cost \$3 each and come in sets of 5. If Blaine buys 12 sets of each type of magnet, how much will he pay?

Number model with unknown:

Estimate: _____

Answer (with unit): _____

- **(3)** 45 ÷ 5 = _____
- 4) 56 ÷ 8 = ____

- **6** = 4