## Decomposing Fractions

Family Note In class today your child learned to decompose fractions into smaller parts. For example, $\frac{5}{6}$ can be decomposed into $\frac{1}{6}+\frac{1}{6}+\frac{1}{6}+\frac{1}{6}+\frac{1}{6}, \frac{2}{6}+\frac{3}{6}, \frac{1}{6}+\frac{4}{6}$, and so on.

Complete the name-collection boxes using equations.
(1)

| $\frac{11}{5}$ |
| :--- |
|  |
|  |
|  |
|  |

(2)

(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:

$\qquad$ b. Equation:

$\qquad$

## Practice

(4) $9 * 785=$ $\qquad$
(5) $461 * 7=$
$\qquad$
(6) $644 * 4=$ $\qquad$
(7) $\qquad$ $=39 * 50$

## What Is the Whole?

For Problems 1-3, use your Geometry Template or sketch the shapes.
(1) Suppose $\square$ is $\frac{1}{4}$. Draw each of the following:
Example: $\frac{3}{4}$
a. 1
b. $1 \frac{1}{2}$
c. 2

(2) Suppose
 is $\frac{2}{3}$. Draw each of the following:
a. $\frac{1}{3}$
b. 1
c. $\frac{4}{3}$
d. 2
(3) Suppose is $\frac{1}{3}$. Draw each of the following:
a. $\frac{3}{3}$
b. 2
c. $\frac{5}{3}$
d. $1 \frac{1}{3}$

Practice
(4) $\frac{4}{5}=\frac{8}{\square}$
(5) $\frac{3}{\square}=\frac{9}{12}$
(6) $\frac{9}{10}=\frac{\square}{100}$

## Adding Fractions

Solve the number stories. Use a different strategy for each one.
(1) 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
(1) 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?
a. Fill in the whole box.
b. Number model with unknown:

Whole
$\square$
$\qquad$
c. One way to solve a fraction addition problem:
d. Answer (with unit): $\qquad$
(2) 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?
a. Fill in the whole box.
b. Number model with unknown:

| Whole |
| :--- |

c. A different way to solve a fraction addition problem:
d. Answer (with unit): $\qquad$
Add.
(3) $\frac{2}{5}+\frac{1}{5}=$ $\qquad$ (4) $\frac{1}{2}+\frac{3}{2}=$
(5) $\frac{5}{6}+\frac{5}{6}=$ $\qquad$ (6) $\frac{1}{3}+\frac{2}{3}+\frac{1}{3}=$
$\qquad$
$\qquad$

## Practice

Represent the fractions as decimals.
(7) $\frac{4}{10}=$ $\qquad$ (8) $\frac{40}{100}=$ $\qquad$ (9) $\frac{6}{10}=$ $\qquad$ (10) $\frac{6}{100}=$
$\qquad$

## Mixed-Number Addition

Solve the number stories. Use a different strategy for each one.
(1) 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?
a. Fill in the whole box.
b. Number model with unknown:

Whole
c. One way to solve a mixed-number addition problem:
d. Answer (with unit):
(2) 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?
a. Fill in the whole box.
b. Number model with unknown:

## Whole

Whole
c. A different way to solve a mixed-number addition problem:
d. Answer (with unit): $\qquad$
Add. Show your work.
(3) $5 \frac{2}{6}+3 \frac{1}{6}=$ $\qquad$ (4) $1 \frac{5}{8}+2 \frac{3}{8}=$
(5) $3 \frac{3}{4}+2 \frac{3}{4}=$ $\qquad$ (6) $3 \frac{2}{5}+1 \frac{4}{5}+2 \frac{3}{5}=$
$\qquad$
$\qquad$

## Practice

$837 * 6=$ $\qquad$(8) $\qquad$ $=468 * 5$
(9) $\qquad$ (10) $56 * 70=$ $\qquad$

## 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): $\qquad$
(2) $\frac{68}{100}+\frac{3}{10}$

Equation: $\qquad$
(3) $\frac{1}{10}+\frac{50}{100}$

Equation: $\qquad$
(4) $\frac{4}{10}+\frac{60}{100}+\frac{3}{10}+\frac{81}{100}$

Equation: $\qquad$
(5) $1 \frac{3}{10}+5 \frac{64}{100}$

Equation: $\qquad$
(6) $3 \frac{22}{100}+2 \frac{8}{10}$

Equation: $\qquad$
(7) $\frac{15}{10}+\frac{78}{100}$

Equation: $\qquad$
(8) Nicholas shaded $\frac{40}{100}$ of his hundreds grid. Victor shaded $\frac{5}{10}$ of his grid.

Who shaded more? $\qquad$
How much did they shade in all? $\qquad$ of a grid

## Practice

Write three equivalent fractions.
(9) $\frac{1}{2}=$ $\qquad$
(11) $\frac{1}{4}=$ $\qquad$
(10) $\frac{1}{3}=$ $\qquad$
(12) $\frac{1}{5}=$ $\qquad$

## Fraction Error Finder

## Home Link 5-6

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 $\frac{1}{8}$
Evan got $\frac{1}{8}$
(1) Identify Zeke's two errors, correct them, and explain why your answer is correct.
(2) 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.
(3) $8,936+6,796=$ $\qquad$ (4) $635-392=$
(5) $6,386+4,205=$ $\qquad$ (6) $900-463=$ $\qquad$

204

## Subtracting Fractions

Solve the number stories. Use a different strategy for each one.
(1) 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?
a. Fill in the whole box. Whole
b. Number model with unknown: $\qquad$
c. One way to solve a fraction subtraction problem:
d. Answer (with unit): $\qquad$
(2) Kendra's computer battery had $\frac{9}{10}$ 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 Lydia use?
$\square$
b. Number model with unknown: $\qquad$
c. Another way to solve a fraction subtraction problem.
d. Answer (with unit): $\qquad$

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

## Practice

(6)
$8,936+6,796=$ $\qquad$ (7)
$=4,635-2,392$
(8) $\qquad$ $=46,386+4,205$
(9) $65,900-48,463=$ $\qquad$

## 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?

a. Fill in the whole box.
b. Number model with unknown: $\qquad$
c. One way to solve a mixed-number subtraction problem:
d. Answer (with unit): $\qquad$
(2) 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?
Whole
a. Fill in the whole box.
b. Number model with unknown: $\qquad$
c. A different way to solve a mixed-number subtraction problem:
d. Answer (with unit): $\qquad$

Subtract. Show your work.
(3) $4 \frac{1}{2}-3 \frac{1}{2}=$ $\qquad$ (4) $\qquad$ $=5 \frac{8}{12}-5 \frac{3}{12}$
(5) $4 \frac{2}{5}-1 \frac{4}{5}=$ $\qquad$ (6) $\qquad$ $=9 \frac{4}{10}-3 \frac{8}{10}$

## Practice

(7) $\qquad$ $=54 * 10$
(8) $63 * 100=$ $\qquad$
(9) $86 * 94=$ $\qquad$
(10) $5,715 * 6=$ $\qquad$

## Student Growth

Mrs. Welch surveyed her students about how much they had grown over the past year. This is the data she gathered.
(1) Plot the data set on the line plot.
the Past Year
(to the nearest $\frac{1}{2}$ inch)

| $1 \frac{1}{2}$ | $1 \frac{1}{2}$ |
| :---: | :---: |
| 2 | $2 \frac{1}{2}$ |
| $2 \frac{1}{2}$ | 2 |
| $\frac{1}{2}$ | $1 \frac{1}{2}$ |
| $2 \frac{1}{2}$ | $\frac{1}{2}$ |
| 1 | 2 |
| $1 \frac{1}{2}$ | 2 |
| $1 \frac{1}{2}$ | $\frac{1}{2}$ |
| $3 \frac{1}{2}$ | $1 \frac{1}{2}$ |
| 1 | 1 |
| 1 | $2 \frac{1}{2}$ |
| 2 | 2 |
| $2 \frac{1}{2}$ | $1 \frac{1}{2}$ |

Use the completed line plot to answer the questions.
(2) What is the greatest number of inches a student grew in a year?

About $\qquad$ inch(es)

The least? About $\qquad$ inch(es)
(3) What is the difference between the greatest and the least number of inches grown?

Number model with unknown: $\qquad$ Answer: $\qquad$ inch(es)

## Practice

Circle the three equivalent fractions in each group.
(4) $\frac{1}{4}, \frac{3}{6}, \frac{1}{8}, \frac{2}{8}, \frac{3}{12}$
(5) $\frac{3}{4}, \frac{4}{8}, \frac{6}{8}, \frac{5}{6}, \frac{9}{12}$
(6) $\frac{2}{3}, \frac{1}{5}, \frac{4}{6}, \frac{7}{12}, \frac{8}{12}$
(7) $\frac{1}{2}, \frac{5}{10}, \frac{4}{8}, \frac{7}{12}$

## Rotations

NAME

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.

Please return this Home Link to school tomorrow.

left turn counterclockwise
right turn clockwise

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 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 $F$.
(2) Face north. Do a $\frac{3}{4}$ turn clockwise. Mark the direction you are facing with the letter $C$.
(4) Face west. Make less than a $\frac{1}{4}$ turn clockwise. Mark the direction you are facing with the letter $E$.
(6) 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)
$85 * 50=$ $\qquad$
(9)

$$
=597 * 4
$$

(8) $416 * 6=$ $\qquad$
(10) $1,373 * 7=$ $\qquad$

Family Note Our class has been learning about turns, angles, and angle measures. A full turn can be represented by an angle of $360^{\circ}$, a $\frac{1}{2}$ turn by an angle of $180^{\circ}$, a $\frac{1}{4}$ turn by an angle of $90^{\circ}$, 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)
(1) about $180^{\circ}$
angle $\qquad$
(2) about $90^{\circ}$
angle $\qquad$
(3) about $270^{\circ}$
(4) between $0^{\circ}$ and $90^{\circ}$
angle $\qquad$
(5) between $90^{\circ}$ and $180^{\circ}$
angle $\qquad$

| Rotation | Degrees |
| :---: | :---: |
| $\frac{1}{4}$ turn | $90^{\circ}$ |
| $\frac{1}{2}$ turn | $180^{\circ}$ |
| $\frac{3}{4}$ turn | $270^{\circ}$ |
| full turn | $360^{\circ}$ |




## Practice

(6) $5,956+4,983=$ $\qquad$ (7) $60,351+86,037=$ $\qquad$
(8) $41,015-517=$ $\qquad$ (9) $23,730-10,769=$ $\qquad$

## 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?
$\qquad$

b. How many sides of the cutoff piece are the same length? $\qquad$ sides
c. How many angles are the same size? $\qquad$ 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.


2 in.
a. Unfold the cutoff piece. What shape is it? $\qquad$
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.

## Practice

(3) $81 \div \square=9$
(5) $7=42 \div$ $\qquad$
(7) $36 \div$ $\qquad$ $=4$
(4) $\div 9=6$
(6) $\div 9=8$
(8) $8=$ $\qquad$ $\div 6$

# Expressing Answers to Number Stories 

Home Link 5-13
NAME
DATE
TIME

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: $\qquad$
Estimate: $\qquad$

Answer (with unit): $\qquad$
(2) 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: $\qquad$
Estimate: $\qquad$

Answer (with unit): $\qquad$

## Practice

(3) $45 \div 5=$
(4) $56 \div 8=$ $\qquad$
(5) $54 \div 9=$ $\qquad$
(6) $\qquad$ $\div 9=4$
(7) $\div 6=6$
(8) $\qquad$

## Unit 6: Family Letter

## Home Link 5-14

## Division; Angles

## Division

In Unit 6 your child will divide multidigit numbers using extended division facts, multiples, area models, and partial quotients. Working with more than one division strategy helps students build conceptual knowledge and means that they have more than just one method to choose from. Throughout the unit students solve multistep division number stories involving dividends with multiple digits, learn the meaning of the remainders, and apply their division skills in real-life contexts.

The unit begins with extended division facts. Knowing that $24 \div 4=6$ enables students to see that $240 \div 4=60 ; 240 \div 40=6 ; 2,400 \div 4=600$; and so forth. Students play Divide and Conquer, where they practice dividing with extended facts. The confidence they build by working with extended division facts will help them to divide larger numbers with ease.

Students also learn the partial-quotients division method, in which the dividend is divided in a series of steps. The first example below illustrates a model of the partial-quotients method for $1,325 \div 9$. When students partition, or divide, the 1,325 into parts $(900+360+$ $63+2$ ), it helps them develop their understanding of the algorithm. The second example uses the partial-quotients method. The quotients for each step are added together to give the final answer.


## Angles

Students continue their work with angle measurement and learn to use both full-circle and half-circle protractors. They learn that angle measurements can be added, and they use this understanding and properties of angles to find unknown angle measures.

## Fraction Operations

Students continue working with addition and subtraction of fractions and mixed numbers. They apply their knowledge of multiplication to explore multiplying a fraction by a whole number.

Please keep this Family Letter for reference as your child works through Unit 6.

## Vocabulary

Important terms in Unit 6:
complementary angles Angles with measures that equal $90^{\circ}$ when added together.
reflex angle An angle measure that is between $180^{\circ}$ and $360^{\circ}$.
extended division facts Variations of division facts involving multiples of 10,100 , and so on. For example, $720 \div 8=90$ is an extended fact related to $72 \div 8=9$.
partial quotients A way to divide in which the dividend is divided in a series of steps. The quotients for each step (called partial quotients) are added to give the final answer.
protractor A tool that measures angles in degrees.

straight angle An angle that measures $180^{\circ}$.
supplementary angles Angles with measures that equal $180^{\circ}$ when added together.

## Do-Anytime Activities

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

1. Practice extended division facts, such as $1,800 \div 30$.
2. Ask your child to help you divide something for dinner into equal portions for each member of your family. For example, ask, "How can we divide the 5 chicken breasts equally for the 4 of us?"
3. Ask questions like these:

- What kind of angles do you see on a stop sign?
- What types of angles are on our tile or wood floors, or on the walls?
- What types of angles are in a rectangular sign?
- What types of angles do you see in the supports for the bridge?

4. Make up some situations such as those listed directly above, and encourage your child to draw a picture or diagram to show you how to solve it.

## Building Skills through Games

In this unit your child will play the following games to increase his or her understanding of division and angles. For detailed instructions on how to play these games, please see the Student Reference Book.

Angle Add-Up See Student Reference Book, page 248. This game provides practice adding and subracting angle measures.
Divide and Conquer See Student Reference Book, page 254. This game for three players-the Caller, the Brain, and the Calculator-provides practice with extended division facts.

## 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 some of the Home Links in Unit 6.

## Home Link 6-1

1. $4 ; 40$
2. a. 5
b. 50
c. 500
d. 5
3. a. 2
b. 20
c. 200
d. 2
4. 2,280
5. 6,335

## Home Link 6-2

1. Sample answer: $2 * s=60 ; 30$ meters
2. $3 ; 7 ; 45 ; 10$
3. 60
4. 60

## Home Link 6-3

1. $40,42,44,46,48,50$;
$46 / 2=b ; 23$ packages; $46 / 2=23$
2. 820
3. 999

## Home Link 6-4

1. Sample estimate: $45 / 3=15 ; 48 \div 3=p$; 16 pounds
2. Sample answer: $\frac{3}{6} ; \frac{4}{8}$
3. Sample answer: $\frac{1}{4} ; \frac{3}{12}$

## Home Link 6-5

1. Sample answer: 115 is the total number of students. 4 is the number of buses. 28 is the number of students per bus. 3 is the number of students left over after dividing evenly.
2. Sample answer: Because 28 students from each class can be on a bus and there are 3 students left over, 3 buses will have 29 students. Then, because each bus needs a teacher, 3 buses will have 30 passengers on them and 1 bus will have 29 passengers.

Mr. Atkins's class has too many students to fit on one bus. So he can go on the bus with most of his students, and 2 students will have to ride on another bus. His bus will have 30 passengers.

Mrs. Gonzales's class has the fewest students. Because she has 27 students and adding herself makes 28 passengers, her bus will have room for Mr. Atkins's 2 extra students.

Mr. Bates and his students are a perfect fit for a bus. There will be 30 passengers on his bus.

Ms. Smith and her students fit on a bus, with room for one more. However, that spot is not needed.
3. $\frac{7}{8}$
5. $\frac{2}{5}$

## Home Link 6-6

1. 12,$000 ; 7 ; 16,000,11$
2. 8,000 pounds
3. $\frac{7}{8}$
4. $\frac{53}{100}$

## Home Link 6-7

1. Sample answer:
$5 \longdiv { 3 6 0 }$

| -350 |  |
| ---: | ---: |
| 10 | 70 |
| -10 | 2 |
| 0 | 72 |

Sample estimate: $350 \div 5=70 ; 360 \div 5=p$; 72 prizes; 0 prizes
3. Sample estimate: $160 / 8=20 ; 23$
5. $0.08,0.34,0.98,9.8$
7. $>$

## Home Link 6-8



Sample number models are given.
$124 / 8=s ; 15 \frac{4}{8}$, or $15 \frac{1}{2}$ strawberries;
124 / $8 \rightarrow 15$ R4;
B. Reported it as a fraction;

Sample answer: You can cut the remaining strawberries into halves.
3. $\frac{3}{8}, \frac{3}{6}, \frac{3}{5}, \frac{3}{3}$
5. $\frac{1}{2}, \frac{2}{3}, \frac{6}{8}, \frac{99}{100}$

## Home Link 6-9

1. Right; $90^{\circ}$
2. Acute; $45^{\circ}$
3. 692
4. 680

## Home Link 6-10

1. $60^{\circ}$
2. $84^{\circ}$
3. 


7. 65,811
9. 64,091

## Home Link 6-11

1. Sample answer: $30^{\circ}+y=90^{\circ} ; 60^{\circ}$
2. Sample answer: $90^{\circ}-z=75^{\circ} ; 15^{\circ}$
3. Sample answer: $180^{\circ}-60^{\circ}=a ; 120^{\circ}$
4. $\frac{7}{12}, \frac{7}{10}, \frac{7}{9}, \frac{7}{8}$

## Home Link 6-12

1. a. Strawberries; $\frac{3}{12}+\frac{1}{12}=b ; \frac{4}{12}$ pound
b. $\frac{3}{12}-\frac{1}{12}=p ; \frac{2}{12}$ pound
2. $4 \frac{2}{8}+1 \frac{3}{8}=p ; 5 \frac{5}{8}$ pounds
3. 2,400

## Home Link 6-13

1. 45 children; Sample answer:

| $X$ | $X$ | $X$ |  |
| :--- | :--- | :--- | :--- |
| $X$ | $X$ | $X$ |  |
| $X$ | $X$ | $X$ | $X$ $X$ $X$  <br> $X$ $X$ $X$  <br> $X$ $X$ $X$ $X$ $X$ $X$ <br> $X$ $X$ $X$ <br> $X$ $X$ $X$$X$ $X$ $X$ <br> $X$ $X$ $X$ <br> $X$ $X$ $X$ |

5 groups of 9;

$$
9+9+9+9+9=45 ; 5 * 9=45
$$

3. $2 \frac{2}{5}$ veggie pizzas; Sample answer:


4 groups of $\frac{3}{5}$;
$\frac{3}{5}+\frac{3}{5}+\frac{3}{5}+\frac{3}{5}=\frac{12}{5} ; 4 * \frac{3}{5}=\frac{12}{5}$
5. 19

