

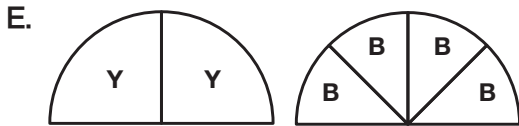
Student Guide

Equivalent Fractions

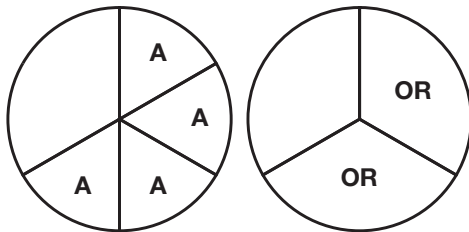
Questions 1–18 (SG pp. 334–339)

- 1.* six $\frac{1}{8}$ -cup measures. Possible explanation: $\frac{6}{8}$ matches $\frac{3}{4}$ on the fraction chart.
- 2.* Responses will vary. Maya and Ming both used area models. Irma found the number of $\frac{1}{8}$ -cup measures that are in one $\frac{1}{4}$ -cup measure and how many $\frac{1}{4}$ -cups are in a $\frac{3}{4}$ -cup measure.

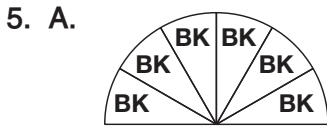
3. A. $\frac{1}{4} = \frac{2}{8}$ B. $\frac{3}{4} = \frac{6}{8}$
 C. $\frac{2}{4} = \frac{4}{8}$ D. $\frac{4}{4} = \frac{8}{8}$



4. A. Two $\frac{1}{3}$ -cup measures = $\frac{2}{3}$ of a cup; $\frac{2}{3} = \frac{2}{3}$
 B. Four $\frac{1}{6}$ -cup measures = $\frac{2}{3}$ of a cup; $\frac{4}{6} = \frac{2}{3}$
 C. Eight $\frac{1}{12}$ -cup measures = $\frac{2}{3}$ of a cup; $\frac{8}{12} = \frac{2}{3}$
 D. Responses may vary. Possible response: two sixths are equal to one-third, so four sixths is equal to two-thirds.



E. $\frac{8}{12} = \frac{2}{3}$ or $8 \times \frac{1}{12} = \frac{2}{3}$ or
 $\frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{12} = \frac{2}{3}$



I kept putting down $\frac{1}{12}$, or a black piece, until I got $\frac{1}{2}$ of a whole, or pink, piece.

- B. $\frac{1}{2} = \frac{6}{12}$
 C. 6 keychains will pack in a box.
6. No, $\frac{1}{2}$ does not equal $\frac{4}{10}$. Explanations will vary. Possible response: 4 purples do not cover 1 pink, or $\frac{4}{10}$ does not line up with $\frac{1}{2}$ on the Fraction Chart.

Copyright © Kendall Hunt Publishing Company

*Answers and/or discussion are included in the lesson.

Equivalent Fractions

Discuss

1. Irma and her friends want to bake some cookies. Her recipe calls for $\frac{3}{4}$ cup of sugar. Irma can find only a $\frac{1}{8}$ -cup measure. How many eighths of a cup of sugar is the same as $\frac{3}{4}$ of a cup? Show how you know.

2. Read about and compare the different ways the friends solved the problem.

Irma's friend, Maya, solved the problem using the Fraction Chart she created with the fraction strips. Look at a Fraction Chart.

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

I looked for $\frac{3}{4}$ on the Fraction Chart. $\frac{3}{4}$ lines up with $\frac{6}{8}$. So Irma will need to use the $\frac{1}{8}$ -cup measure 6 times to measure $\frac{3}{4}$ of a cup of sugar.

Irma's friend, Ming, solved the problem using fraction circle pieces.

If I think of the red circle as the whole, then 3 yellows are $\frac{3}{4}$. One blue piece is $\frac{1}{8}$. It takes 6 blue pieces to cover the 3 yellow pieces. So there are 6 eighths in $\frac{3}{4}$ of a cup.

334 5G • Grade 4 • Unit 8 • Lesson 8 Equivalent fractions

Student Guide - Page 334

Explore

3. Complete the number sentences to show equivalent fractions. **Equivalent fractions** are fractions that have the same value. Use the Fraction Chart or fraction circle pieces to find the equivalent fractions. Remember: the red circle is the unit whole.

A. $\frac{1}{4} = \frac{2}{8}$ B. $\frac{3}{4} = \frac{7}{8}$
 C. $\frac{2}{4} = \frac{7}{8}$ D. $\frac{4}{4} = \frac{7}{8}$

E. Draw the fraction circle pieces to show how you answered Question 3C.

Use the fraction circle pieces or the Fraction Chart to solve the following problems. When using the circle pieces, think of the red circle as one whole.

4. Frank is making bread and needs $\frac{2}{3}$ of a cup of flour. He has a few different measuring cups.

A. How many $\frac{1}{3}$ -cup measures equal $\frac{2}{3}$ of a cup?
 B. How many $\frac{1}{6}$ -cup measures equal $\frac{2}{3}$ of a cup?
 C. How many $\frac{1}{12}$ -cup measures equal $\frac{2}{3}$ of a cup?
 D. Show how you solved Question 4B with the circle pieces.
 E. Write a number sentence for Question 4C.

5. Romesh is helping his father pack a box of key chains for a fundraiser. The box holds $\frac{1}{2}$ pound of merchandise. Each key chain weighs $\frac{1}{12}$ of a pound. Romesh must decide how many key chains he can pack in the box.

A. Show how you solved the problem with fraction circle pieces.
 B. Help Romesh by completing this number sentence: $\frac{1}{2} = \frac{\quad}{12}$
 C. How many key chains can Romesh pack in a box?

6. Maya wrote: $\frac{1}{2} = \frac{4}{10}$
 Do you agree with Maya? Explain how you know.

336 5G • Grade 4 • Unit 8 • Lesson 8 Equivalent fractions

Student Guide - Page 336

7. Nicholas and his friends are trying to collect money to help take care of their class pet. The Parent Teacher Group donated $\frac{1}{2}$ of the money needed. The class needed to collect the other $\frac{1}{2}$ of the money. Below is a list of other money they have collected.

John's Pet Shop donated $\frac{1}{4}$ of the money needed.
 Ms. Adams donated $\frac{1}{8}$ of the money needed.
 The Grocery donated $\frac{1}{8}$ of the money needed.


- A. Did they collect all the money needed to take care of the class pet?
 B. Show how to solve the problem using circle pieces.
 C. Nicholas started to write a number sentence for this problem. Help him complete it.

$$\frac{1}{2} = \frac{1}{4} + \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$$

Finding Equivalent Fractions

For Questions 8–18, think of the red circle as one whole.

8. Use the fraction circle pieces to find fractions equal to $\frac{1}{2}$.
 9. Jerome wrote: $\frac{1}{2} = \frac{50}{100}$. Do you agree with Jerome? Explain.
 10. A. Nila showed how she decided that $\frac{1}{2} = \frac{10}{20}$. In your own words, what did Nila do?



$$\frac{1}{2} = \frac{1 \times 10}{2 \times 10} = \frac{10}{20}$$

I multiplied the top and bottom by 10 and got $\frac{10}{20}$. So $\frac{1}{2} = \frac{10}{20}$.

- B. Help Nila find another fraction equal to $\frac{1}{2}$.

$$\frac{1}{2} = \frac{1 \times 20}{2 \times 20} = \frac{\square}{\square}$$

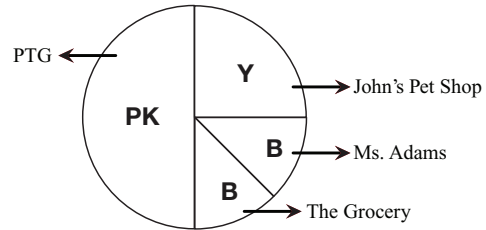
11. A. Use the fraction circle pieces to show two fractions equal to $\frac{3}{4}$.
 B. Use Nila's method to find two other fractions equal to $\frac{3}{4}$.

Copyright © Kendall Hunt Publishing Company

Student Guide - Page 337

7. A. Yes.

- B. Possible response: I used the circle pieces to cover a red piece. This is all the money they needed to collect.



C. $\frac{1}{2} = \frac{1}{4} + \frac{1}{8} + \frac{1}{8}$

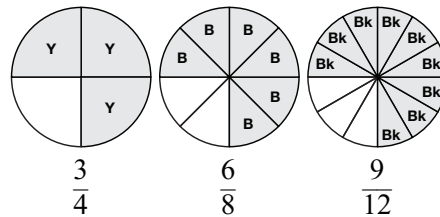
- 8.* See lesson, Figure 1.

- 9.* Yes, $\frac{1}{2}$ is equal to $\frac{50}{100}$. Possible explanation: I know a half-dollar is 50¢. I know 50 + 50 = 100. So 50 is half of 100.

10. A. She multiplied the top and the bottom by the same number to find an equal fraction.

B. $\frac{20}{40} = \frac{1}{2} = \frac{1 \times 20}{2 \times 20} = \frac{20}{40}$

11. A.*



- B.* Possible response:

$$\frac{3}{4} = \frac{3 \times 10}{4 \times 10} = \frac{30}{40}$$

18. Complete the number sentences below. Use your Fraction Chart or the fraction circle pieces.

- A. $\frac{3}{4} = \frac{7}{8}$ B. $\frac{1}{2} = \frac{2}{10}$ C. $\frac{2}{3} = \frac{2}{6}$ D. $\frac{2}{5} = \frac{2}{10}$
 E. $\frac{1}{2} = \frac{4}{7}$ F. $\frac{6}{10} = \frac{2}{5}$ G. $\frac{8}{12} = \frac{2}{7}$ H. $\frac{3}{12} = \frac{2}{8}$

Homework

Use the *Fraction Circle Pieces* from the Reference section, the Fraction Chart, or number sentences to solve the problems.

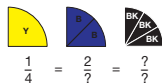
1. For each fraction below, write two other equivalent fractions.

- A. $\frac{2}{4}$ B. $\frac{5}{10}$
 C. $\frac{2}{6}$ D. $\frac{6}{9}$
 E. $\frac{5}{5}$ F. $\frac{2}{3}$

G. Show how to use the Fraction Chart to answer Question 1C.

H. Show how to use fraction circle pieces to answer Question 1D.

2. A. Maria is looking for three fractions equivalent to $\frac{1}{4}$. Complete Maria's number sentences.



B. To find a third equivalent fraction, Maria wrote the following. Complete the number sentence Maria started.

$$\frac{1 \times \square}{4 \times \square} = \frac{4}{16}$$

Copyright © Kendall Hunt Publishing Company

Student Guide - Page 339

3. Maya wrote number sentences to show fractions that are equivalent to $\frac{1}{3}$. She forgot to write in some of the numerators and denominators. Complete Maya's number sentences by filling in the missing numbers to make each sentence a true sentence.

- A. $\frac{1}{2} = \frac{3}{7}$ B. $\frac{1}{2} = \frac{7}{18}$ C. $\frac{1}{2} = \frac{12}{7}$
 D. $\frac{1}{2} = \frac{7}{20}$ E. $\frac{1}{2} = \frac{25}{7}$ F. $\frac{1}{2} = \frac{7}{7}$

4. Write 5 fractions equivalent to $\frac{2}{3}$.

5. Romesh is packing a box filled with plastic cars for his father. The box holds $\frac{3}{4}$ pound of merchandise. Each plastic car weighs $\frac{1}{16}$ of a pound.

- A. Complete this number sentence to help Romesh decide how many sixteenths of a pound is equivalent to $\frac{3}{4}$ of a pound. $\frac{3}{4} = \frac{7}{16}$.
 B. How many plastic cars can Romesh pack in the box?
 C. What is another name for $\frac{1}{16}$ of a pound?



6. Write 5 fractions equivalent to $\frac{2}{5}$.

7. Shannon wants to purchase $\frac{1}{3}$ yard of ribbon. There are 36 inches in a yard.

- A. Complete the following number sentence to help the clerk decide how many inches of ribbon she must cut: $\frac{1}{3} = \frac{7}{36}$.
 B. How many inches of ribbon should she cut?
 C. What is another name for $\frac{1}{36}$ of a yard?



Student Guide - Page 340

Student Guide

Homework

Questions 1–12 (SG pp. 339–341)

1. Possible responses include:

- A. $\frac{2}{4} = \frac{4}{8} = \frac{8}{16}$ B. $\frac{5}{10} = \frac{1}{2} = \frac{50}{100}$
 C. $\frac{2}{6} = \frac{1}{3} = \frac{4}{12}$ D. $\frac{6}{8} = \frac{3}{4} = \frac{9}{12}$
 E. $\frac{5}{5} = \frac{99}{99} = \frac{4}{4}$ F. $\frac{2}{3} = \frac{4}{6} = \frac{12}{18}$

G. Responses will vary. Possible response:

I looked at the chart and $\frac{2}{6}$ lined up with $\frac{1}{3}$ and $\frac{4}{12}$.

H. Possible response: 6 purple pieces equal 3 yellow pieces and 6 purple pieces equal 9 black pieces.

2. A. $\frac{1}{4} = \frac{2}{8} = \frac{3}{12}$
 B. $\frac{1 \times 4}{4 \times 4} = \frac{4}{16}$

3. A. $\frac{1}{2} = \frac{3}{6}$ B. $\frac{1}{2} = \frac{9}{18}$
 C. $\frac{1}{2} = \frac{12}{24}$ D. $\frac{1}{2} = \frac{10}{20}$
 E. $\frac{1}{2} = \frac{25}{50}$ F. $\frac{1}{2} = \frac{7}{14}$

4. Possible response:

$$\frac{2}{3} = \frac{4}{6} = \frac{8}{12} = \frac{20}{30} = \frac{10}{15} = \frac{50}{75}$$

5. A. $\frac{3}{4} = \frac{12}{16}$
 B. 12 plastic cars
 C. an ounce

6. Possible response:

$$\frac{2}{5} = \frac{4}{10} = \frac{6}{15} = \frac{8}{20} = \frac{200}{500} = \frac{16}{40}$$

7. A. $\frac{1}{3} = \frac{12}{36}$
 B. 12 inches
 C. foot

Copyright © Kendall Hunt Publishing Company

8. A. $\frac{1}{2} = \frac{6}{12}$; $\frac{1}{2} = \frac{1 \times \boxed{6}}{2 \times \boxed{6}} = \frac{\boxed{6}}{12}$
- B. $\frac{3}{4} = \frac{6}{8}$; $\frac{3}{4} = \frac{3 \times \boxed{2}}{4 \times \boxed{2}} = \frac{\boxed{6}}{8}$
- C. $\frac{4}{12} = \frac{2}{6}$; $\frac{4}{12} = \frac{4 \div \boxed{2}}{12 \div \boxed{2}} = \frac{\boxed{2}}{\boxed{6}}$
- D. $\frac{6}{9} = \frac{2}{3}$; $\frac{6}{9} = \frac{6 \div \boxed{3}}{9 \div \boxed{3}} = \frac{\boxed{2}}{3}$
- E. $\frac{4}{6} = \frac{10}{15}$; $\frac{4}{6} = \frac{4 \div 2}{6 \div 2} = \frac{2 \times \boxed{5}}{3 \times \boxed{5}} = \frac{\boxed{10}}{\boxed{15}}$
- F. $\frac{6}{8} = \frac{9}{12}$; $\frac{6}{8} = \frac{6 \div 2}{8 \div 2} = \frac{3 \times \boxed{3}}{4 \times \boxed{3}} = \frac{\boxed{9}}{12}$
9. A. $\frac{1}{4} = \frac{25}{100}$; $\frac{1}{4} = \frac{1 \times \boxed{25}}{4 \times \boxed{25}} = \frac{\boxed{25}}{100}$
- B. $\frac{3}{5} = \frac{12}{20}$; $\frac{3}{5} = \frac{3 \times \boxed{4}}{5 \times \boxed{4}} = \frac{\boxed{12}}{20}$
- C. $\frac{1}{4} = \frac{5}{20}$; $\frac{1}{4} = \frac{1 \times \boxed{5}}{4 \times \boxed{5}} = \frac{\boxed{5}}{20}$
10. A. $\frac{12}{48} = \frac{1}{4}$; $\frac{12}{48} = \frac{12 \div \boxed{12}}{48 \div \boxed{12}} = \frac{\boxed{1}}{4}$
- B. $\frac{2}{4} = \frac{3}{6}$; $\frac{2}{4} = \frac{1}{2} = \frac{1 \times \boxed{3}}{2 \times \boxed{3}} = \frac{\boxed{3}}{6}$
- C. $\frac{4}{6} = \frac{6}{9}$; $\frac{4}{6} = \frac{4 \div 2}{6 \div 2} = \frac{2 \times \boxed{3}}{3 \times \boxed{3}} = \frac{\boxed{6}}{9}$

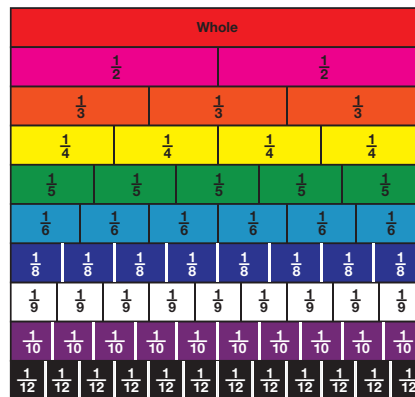
11. Possible response: 4 black pieces are the same as 2 aqua pieces. Also see answer to 8C.
12. Possible response: 6 blue pieces are equal to 4 yellow pieces. 1 yellow piece is 3 black pieces. So 3 yellow pieces is 9 black pieces, or $\frac{9}{12}$. Also see answer to 8F.

Use the Fraction Chart, the *Fraction Circle Pieces* page in the Reference section, or a calculator to help you complete the number sentences.

8. A. $\frac{1}{2} = \frac{?}{12}$ B. $\frac{3}{4} = \frac{?}{8}$ C. $\frac{4}{12} = \frac{?}{7}$
- D. $\frac{6}{9} = \frac{?}{3}$ E. $\frac{4}{6} = \frac{10}{?}$ F. $\frac{6}{8} = \frac{?}{12}$
9. A. $\frac{1}{4} = \frac{?}{100}$ B. $\frac{3}{5} = \frac{?}{20}$ C. $\frac{1}{4} = \frac{?}{20}$
10. A. $\frac{12}{48} = \frac{?}{4}$ B. $\frac{2}{4} = \frac{?}{6}$ C. $\frac{4}{6} = \frac{?}{9}$

11. Show or tell how you solved Question 8C.
12. Show or tell how you solved Question 8F.

Fraction Chart



Copyright © Kendall Hunt Publishing Company

Equivalent Fractions

SG • Grade 4 • Unit 8 • Lesson 8 341

Student Guide - Page 341