

Student Guide

Fractions in Simplest Form (SG pp. 210–215)

Questions 1–9

1. * $\frac{4}{8}$ of a mile. Equivalent fractions on the *Fractions on Number Lines Chart* are $\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{5}{10}, \frac{6}{12}$.
2. * 1 pink shows $\frac{1}{2}$;
2 yellows show $\frac{2}{4}$;
3 aquas show $\frac{3}{6}$;
4 blues show $\frac{4}{8}$;
5 purples show $\frac{5}{10}$;
6 blues show $\frac{6}{12}$.
3. A. * Answer will vary. Possible response: $\frac{12}{24}, \frac{20}{40}$.
B. * The smallest circle piece is $\frac{1}{12}$ of the red circle.
4. A. * $\frac{1}{2}$.
B. * Answers will vary. Possible response: The numerator and denominator are the smallest out of all equivalent fractions.

Fractions in Simplest Form

The students in Mr. Moreno's class were using maps to measure distances. Jackie looked at a map to find out how far she lived from Bessie Coleman Elementary School.

Discuss

1. How many eighths of a mile does Jackie live from school? Find this fraction on the *Fractions on Number Lines Chart* in the Reference section. Use the chart to find equivalent fractions.
2. Use circle pieces to show as many other fractions as you can that show how far Jackie lives from school. The red circle represents 1 mile. Draw the circle pieces and write a fraction for each.
3. A. Write two fractions that cannot be shown with circle pieces that show how far Jackie lives from school. Show or tell how you found each fraction.
B. Why can these fractions not be shown with circle pieces?

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Mr. Moreno said, "Fractions that have the same value are called **equivalent fractions**. Equivalent fractions can be found using circle pieces or number lines. They can also be found by multiplying or dividing the numerator and denominator by the same number." Mr. Moreno wrote two examples on the board.

$$\frac{3}{4} = \frac{3 \times 2}{4 \times 2} = \frac{6}{8}$$

and

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

"Every fraction has an unlimited number of equivalent fractions," said Mr. Moreno, "but only one of them is in the **simplest form**. That means the numerator and denominator are the smallest possible whole numbers, or **lowest terms**. For example, $\frac{3}{4}, \frac{6}{8}$, and $\frac{15}{20}$ are all equivalent fractions, but $\frac{3}{4}$ is in the simplest form.

"To **simplify** a fraction means to write the fraction in simplest form. Sometimes we call this **reducing** the fraction."

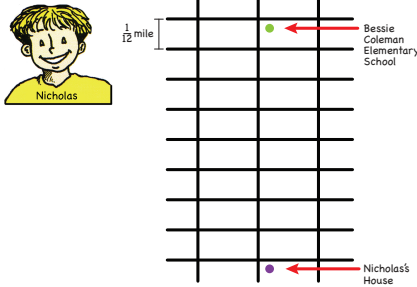
4. A. What fraction gives the answer to Question 1 in simplest form? Show or tell how you found your answer.
B. How do you know the fraction is in lowest terms?

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

Nicholas uses a different map to find out how far he lives from school.



5. A. How many twelfths of a mile does Nicholas live from school? Show your answer using fraction circle pieces. The red circle represents 1 mile.
- B. Use circle pieces to find two equivalent fractions for the fraction in Question 5A. Show or tell how you know they are equivalent.
- C. Find two more equivalent fractions that cannot be shown with circle pieces. Show or tell how you found your fractions.
- D. Write the fraction in simplest form. How do you know it is in simplest form?

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Jacob solved the problem this way.



$\frac{8}{12} = \frac{8 \div 2}{12 \div 2} = \frac{4}{6}$
 I divided the top and bottom by 2 and got $\frac{4}{6}$. Then I saw I could divide both the top and bottom again by two.
 $\frac{4}{6} = \frac{4 \div 2}{6 \div 2} = \frac{2}{3}$ of a mile
 2 and 3 are not both divisible by any number, so $\frac{2}{3}$ of a mile is the simplest answer.

So a fraction is only in lowest terms when the numerator and denominator have no common factors other than 1. Jacob showed that $\frac{2}{3}$ is in simplest form because 2 and 3 have no factors in common other than 1.



6. Decide whether each fraction below is in simplest form. If it is not, write the fraction in simplest form.

A. $\frac{2}{6}$	B. $\frac{7}{10}$	C. $\frac{8}{10}$	D. $\frac{750}{1000}$
E. $\frac{9}{12}$	F. $\frac{45}{100}$	G. $\frac{14}{63}$	H. $\frac{40}{200}$
7. Can you think of another way to simplify $\frac{30}{36}$ instead of dividing the numerator and denominator first by 2? If so, show how.
8. Out of 60 people surveyed, 35 said their favorite brand of ice cream is Bessie's Ice Cream.
 - A. Find the simplest form of the fraction of people surveyed who prefer Bessie's brand.
 - B. Use your fraction from Question 8A to complete the ad shown below.



Bessie's Ice Cream

The favorite ice cream of out of every people surveyed!

- C. Is this ad convincing? Explain your thinking.

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5. A. $\frac{8}{12}$ of a mile; 8 black circle pieces.
- B.* Answers will vary. Possible response: $\frac{2}{3}, \frac{4}{6}$, etc. They are equivalent because the fraction circle pieces make the same shape.
- C.* Answers will vary. Possible response: $\frac{10}{15}, \frac{6}{9}, \frac{12}{18}$.
- D.* $\frac{2}{3}$; Possible response: Of all the equivalent fractions, $\frac{2}{3}$ has the smallest numerator and denominator.
- 6.* A. $\frac{1}{3}$
- B. Fraction is in simplest form.
- C. $\frac{4}{5}$
- D. $\frac{11}{20}$
- E. $\frac{3}{4}$
- F. $\frac{9}{20}$
- G. $\frac{2}{9}$
- H. $\frac{1}{5}$
- I. The smallest number of circle pieces that cover 8 purple pieces is 4 green pieces, which cover $\frac{4}{5}$ of the red circle.
- J. The simplest fraction that lines up vertically with $\frac{9}{12}$ is $\frac{3}{4}$.
- K. For $\frac{14}{63}$, both the numerator and the denominator can be divided by 7. For $\frac{40}{200}$, both can be divided by 40.
- 7.* Yes, you can divide by 6 first to get $\frac{5}{6}$.
- 8.* A. $\frac{7}{12}$
- B. The favorite ice cream of 7 out of every 12 people surveyed.
- C. Answers will vary.

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

9. A. 6 purples
 B. No; Possible response: Both the numerator and denominator are divisible by 2.
 C. The smallest number of pieces that covers 6 purples is 3 greens, or $\frac{3}{5}$ of the red circle.
 D. The simplest fraction that $\frac{6}{10}$ lines up with is $\frac{3}{5}$.
 E. Both the numerator and denominator of $\frac{6}{10}$ can be divided by 2 to get $\frac{3}{5}$.

Homework (SG p. 7)
Questions 1–2

Answers will vary. Possible responses:

1. A. Fraction is in simplest form.
 B. $\frac{2}{5}$
 C. $\frac{1}{4}$
 D. $\frac{2}{4}$
 E. $\frac{2}{5}$
 F. $\frac{4}{5}$
 G. $\frac{3}{4}$
 H. $\frac{17}{20}$
 I. 1 yellow covers 3 blacks.
 J. For $\frac{48}{60}$, both the top and bottom can be divided by 12. For $\frac{75}{100}$, both can be divided by 25.
 2. He practiced $\frac{9}{10}$ of an hour. $15 + 10 + 20 + 9 = 54$ total minutes out of 60 minutes in an hour. Both the top and bottom of $\frac{54}{60}$ can be divided by 6 to get $\frac{9}{10}$.

✓ **Check-In: Question 9**

9. Ana has an odometer on her bicycle to measure distances. She set the odometer to zero when she left her house for school. The odometer read 0.6 or $\frac{6}{10}$ of a mile when she got to school.
 A. Use circle pieces to show $\frac{6}{10}$ of a mile. A red circle represents 1 mile.
 B. Is $\frac{6}{10}$ of a mile the simplest form of the fraction? Show or tell how you know.
 C. Show how to find the simplest form of $\frac{6}{10}$ using circle pieces.
 D. Show how to find the simplest form of $\frac{6}{10}$ using the *Fractions on Number Lines Chart*.
 E. Show how to find the simplest form of $\frac{6}{10}$ using Jacob's method of dividing the top and bottom by the same number.



1. Decide whether each fraction is in simplest form. If it is not, reduce the fraction to lowest terms.
 A. $\frac{9}{26}$ B. $\frac{30}{75}$ C. $\frac{3}{12}$ D. $\frac{150}{300}$
 E. $\frac{4}{10}$ F. $\frac{48}{60}$ G. $\frac{75}{100}$ H. $\frac{850}{1000}$
 I. Make a drawing showing how to use circle pieces to answer Question 1C.
 J. Show how to divide the top and bottom by the same number to answer Questions 1F and 1G.

2. Here is a data table showing the number of minutes Frank practiced guitar last week. What fraction of an hour did he practice for the whole week? Express your answer as a fraction in simplest form. Show or tell how you found your answer.

Guitar Practice	
Day	Minutes Practiced
Sunday	15
Monday	0
Tuesday	10
Wednesday	0
Thursday	20
Friday	0
Saturday	9

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