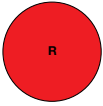
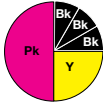


Fraction Sentences

Mr. Moreno gave his class this challenge: Show the unit whole using pieces of three different colors. Then write a number sentence for your figure. For this lesson, the red circle is the unit whole.



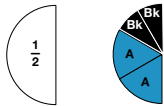
David and Brandon work together. Here is their figure.



Here is David's number sentence: $1 = \frac{3}{12} + \frac{4}{12} + \frac{1}{2}$

Here is Brandon's number sentence: $1 = \frac{1}{12} + \frac{1}{12} + \frac{1}{12} + \frac{1}{4} + \frac{1}{2}$

- Show the unit whole a different way using pieces of three different colors. Write a number sentence for your figure.
- colors. First she shows $\frac{1}{2}$ with a pink piece. Then she trades pieces until she has the figure she wants.
She represents her figure with this number sentence: $\frac{1}{2} = \frac{1}{6} + \frac{1}{6} + \frac{1}{12} + \frac{1}{12}$



- Write another number sentence for Lin's figure.
- Show $\frac{1}{2}$ a different way using two colors. Write a number sentence for your figure.

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Explore

For Questions 3–8, follow the directions in the problem. Then write a number sentence for your figure. The red circle is the unit whole.

- Show $\frac{1}{2}$ using yellow and two other colors.
- Show $\frac{3}{4}$ using yellow and two other colors. (*Hint:* Show $\frac{3}{4}$ with three yellows first, then cover the yellow pieces or trade pieces.)
- Show $\frac{5}{6}$ using black, aqua, and orange.
- Show $\frac{2}{3}$ without using orange.
- Show one whole using one color. (Use any color but red.)
 - Show one whole using a different color.
 - What can you say about the numerator and denominator of a fraction that is equal to 1?
- Show $\frac{5}{3}$ using two colors.

Fractions Greater Than One

Ana and Lin show $\frac{5}{3}$ using one color and write these number sentences:

$$\frac{5}{3} = \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$$

$$5 \times \frac{1}{3} = \frac{5}{3}$$

A fraction is called an **improper fraction** when the numerator is greater than or equal to the denominator. $\frac{5}{3}$ and $\frac{4}{3}$ are improper fractions. A fraction is called a **proper fraction** when the numerator is less than the denominator. $\frac{2}{3}$ is a proper fraction.

Manny shows $\frac{5}{3}$ using red and orange pieces and writes these number sentences:

$$\frac{5}{3} = 1 + \frac{2}{3}$$

$$\frac{5}{3} = \frac{1}{3} + \frac{2}{3}$$

Numbers that are made up of a whole number and a fraction are called **mixed numbers**. $1\frac{2}{3}$ is a mixed number.

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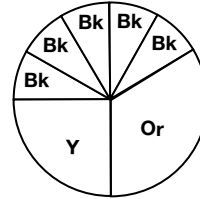
*Answers and/or discussion are included in the lesson.

Student Guide

Fraction Sentences (SG pp. 69–72)

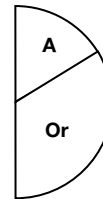
Questions 1–19

1. * Answers will vary. One possible solution is: $\frac{5}{12} + \frac{1}{4} + \frac{1}{3} = 1$. See Figures 2 and 3 in the lesson for other solutions.

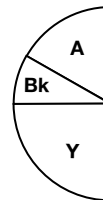


2. A. Answers will vary. Another possible number sentence is: $\frac{2}{6} + \frac{2}{12} = \frac{1}{2}$.

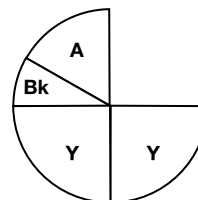
B. Answers will vary. One possible solution is: $\frac{1}{6} + \frac{1}{3} = \frac{1}{2}$.



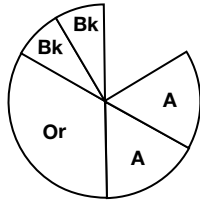
3. $\frac{1}{4} + \frac{1}{12} + \frac{1}{6} = \frac{1}{2}$



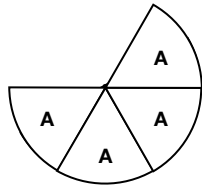
4. Answers will vary. One possible solution is: $\frac{2}{4} + \frac{1}{12} + \frac{1}{6} = \frac{3}{4}$.



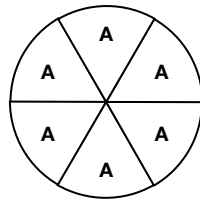
5. Answers will vary. One possible solution is:
 $\frac{1}{3} + \frac{2}{6} + \frac{2}{12} = \frac{5}{6}$.



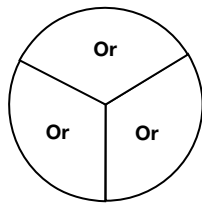
6. Answers will vary. One possible solution is:
 $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{2}{3}$.



7. **A.*** Answers will vary. One possible solution is:
 $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = 1$.

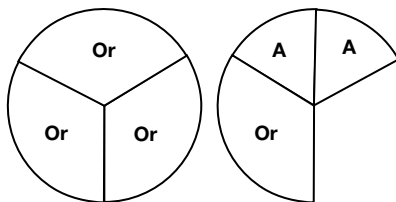


- B.*** Answers will vary. One possible solution is:
 $\frac{3}{3} = 1$.



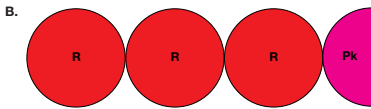
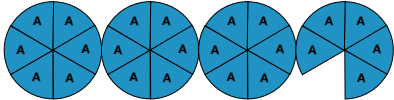
- C.*** The numerator and denominator are the same number when the fraction is equal to 1.

8. Answers will vary. One possible solution is:
 $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{6} + \frac{1}{6} = \frac{5}{3}$.



9. A. Show $\frac{7}{4}$ using only yellow pieces. Write an addition sentence and a multiplication sentence for your figure.
 B. Show $\frac{7}{4}$ using red and yellow pieces. Write an addition sentence for your figure.
 C. Write $\frac{7}{4}$ as a mixed number.
10. A. Show $\frac{5}{2}$ using only pink pieces. Write an addition sentence and a multiplication sentence for your figure.
 B. Show $\frac{5}{2}$ using the fewest number of pieces possible. Write an addition sentence for your figure.
 C. Write a mixed number for $\frac{5}{2}$.
11. A. Show $2\frac{1}{3}$ using only orange pieces. Write a number sentence for your figure.
 B. Show $2\frac{1}{3}$ using the fewest number of pieces possible. Write an addition sentence for your figure.
 C. Write $2\frac{1}{3}$ as an improper fraction.

12. Write a mixed number and an improper fraction for the following figures:



13. Fill in the box to make the sentence true.

A. $2\frac{1}{3} = \square + \frac{1}{3}$

B. $2\frac{1}{3} = \frac{\square}{3}$

C. $\frac{5}{4} = \square + \frac{1}{4}$

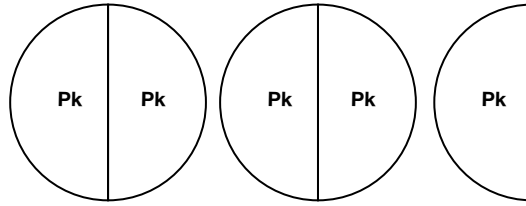
D. $\frac{25}{12} = 2 + \frac{1}{\square}$

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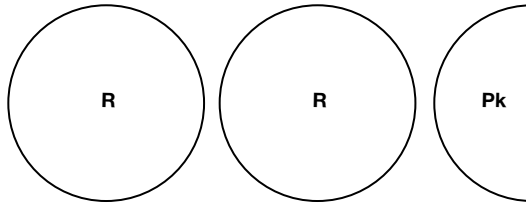
Fraction Sentences

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10. A. Addition sentences will vary. One possible addition sentence is: $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{5}{2}$; $5 \times \frac{1}{2} = \frac{5}{2}$.

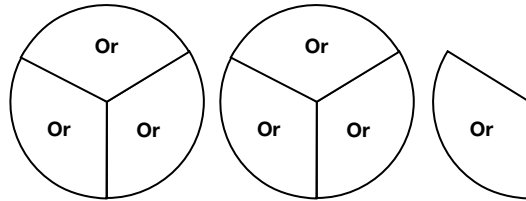


B. $1 + 1 + \frac{1}{2} = \frac{5}{2}$

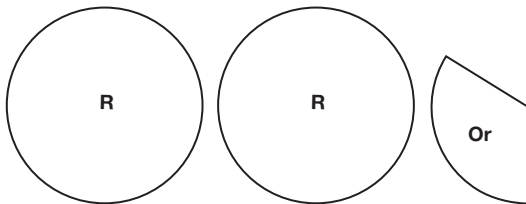


C. $2\frac{1}{2}$

11. A. Answers will vary. One possible addition sentence is: $\frac{3}{3} + \frac{3}{3} + \frac{1}{3} = 2\frac{1}{3}$; $7 \times \frac{1}{3} = 2\frac{1}{3}$.



B. $1 + 1 + \frac{1}{3} = 2\frac{1}{3}$



C. $\frac{7}{3}$

12. A. $3\frac{5}{6}, \frac{23}{6}$

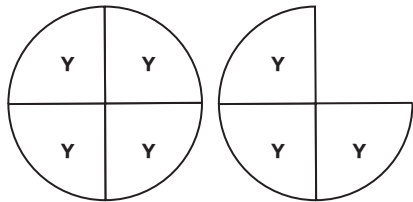
B. $3\frac{1}{2}, \frac{7}{2}$

13. A. 2 B. 7

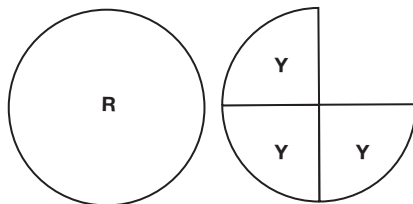
C. 1 D. 12

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9. A. Addition sentences will vary. One possible sentence is $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{7}{4}$; $7 \times \frac{1}{4} = \frac{7}{4}$.



B. $1 + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{7}{4}$.



C. $1\frac{3}{4}$

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14. A. $2\frac{1}{4}$ 15. A. $\frac{13}{12}$
 B. $1\frac{5}{12}$ B. $\frac{7}{2}$
 C. $3\frac{2}{3}$ C.* $\frac{8}{3}$
 D. $1\frac{5}{6}$ D. $\frac{11}{4}$
- 16.* Answers will vary. Possible response: To decide how many wholes there are you can divide the numerator by the denominator. The remainder is the number of pieces that are left over. Use the remainder as the numerator for the fraction. For example, if you have $\frac{17}{6}$, you first divide 17 by 6 to find that you have 2 wholes. There is a remainder of 5 pieces, so that becomes $\frac{5}{6}$. The mixed number is $2\frac{5}{6}$.
- 17.* Answers will vary. Possible response: To find out how many total pieces there are you multiply the whole number by the denominator and then add that answer to the numerator. For example, if the mixed number is $4\frac{1}{5}$, you multiply 4×5 to see that there are 20 fifths in 4 wholes. You add the $\frac{20}{5}$ to $\frac{1}{5}$ for a total of $\frac{21}{5}$.

18. A. $\frac{11}{8}$ 19. A. $3\frac{1}{4}$
 B. $\frac{15}{4}$ B. $4\frac{1}{2}$
 C. $\frac{19}{5}$ C. $4\frac{2}{3}$
 D. $\frac{29}{6}$ D. $2\frac{2}{5}$

Homework (SG p. 73)
Questions 1–3

1. A. Answers will vary. One possible solution is: $\frac{2}{6} + \frac{1}{3} + \frac{1}{4} + \frac{1}{12} = 1$.
 B. $\frac{1}{3} + \frac{1}{4} + \frac{1}{12} = \frac{2}{3}$
 C. Answers will vary. One possible solution is: $1 + \frac{3}{6} = 1\frac{3}{6}$ or $1\frac{1}{2}$.
 D. $\frac{1}{3} + \frac{1}{4} + \frac{1}{6} = \frac{3}{4}$
2. A. $5\frac{1}{2}$ 3. A. $\frac{25}{6}$
 B. $2\frac{3}{8}$ B. $\frac{19}{3}$
 C. $3\frac{1}{6}$ C. $\frac{23}{4}$
 D. $2\frac{1}{9}$ D. $\frac{31}{10}$
 E. $2\frac{3}{5}$ E. $\frac{13}{2}$
 F. $5\frac{2}{3}$ F. $\frac{19}{5}$
 G. $6\frac{3}{4}$ G. $\frac{27}{8}$
 H. $2\frac{3}{10}$ H. $\frac{14}{9}$

14. Write each improper fraction as a mixed number. Use circle pieces.
 A. $\frac{9}{4}$ B. $\frac{17}{12}$ C. $\frac{11}{3}$ D. $\frac{11}{6}$
15. Write each mixed number as an improper fraction. Use circle pieces.
 A. $1\frac{1}{12}$ B. $3\frac{1}{2}$ C. $2\frac{2}{3}$ D. $2\frac{3}{4}$
16. Explain to a friend how you can change an improper fraction to a mixed number without using circle pieces. Use an example in your explanation.
17. Explain to a friend how you can change a mixed number to an improper fraction without using circle pieces. Use an example in your explanation.
18. Write each mixed number as an improper fraction.
 A. $1\frac{3}{8}$ B. $3\frac{3}{4}$ C. $3\frac{4}{5}$ D. $4\frac{5}{6}$
19. Write each improper fraction as a mixed number.
 A. $\frac{13}{4}$ B. $\frac{9}{2}$ C. $\frac{14}{3}$ D. $\frac{12}{5}$



Practice writing number sentences as you play *Fraction Fill Games* in the *Student Activity Book*.

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Homework

1. Write a number sentence for each of the following figures. Remember, the red circle is one whole.
- A.
- B.
- C.
- D.
2. Change each improper fraction to a mixed number.
 A. $\frac{11}{2}$ B. $\frac{19}{8}$ C. $\frac{19}{6}$ D. $\frac{19}{9}$
 E. $\frac{13}{5}$ F. $\frac{17}{3}$ G. $\frac{27}{4}$ H. $\frac{23}{10}$
3. Change each mixed number to an improper fraction.
 A. $4\frac{1}{6}$ B. $6\frac{1}{3}$
 C. $5\frac{3}{4}$ D. $3\frac{1}{10}$
 E. $6\frac{1}{2}$ F. $3\frac{4}{5}$
 G. $3\frac{3}{8}$ H. $1\frac{5}{9}$



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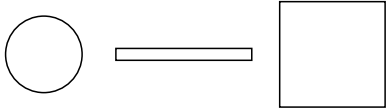
*Answers and/or discussion are included in the lesson.

Name _____ Date _____

Fraction Quiz

You will need fraction circle pieces to complete this quiz.

1. A. Shade $\frac{1}{2}$ of each shape.



B. Are all of the shaded areas the same size? Explain how you know.

2. If the pink is the unit whole, write a fraction for each of the following, both as a number and in words.

A. one aqua

B. three blues

C. one red

3. A. If a blue circle piece is $\frac{1}{2}$, what is the unit whole? _____

B. If a blue circle piece is $\frac{1}{4}$, what is the unit whole? _____

C. An aqua piece is $\frac{1}{2}$ of what circle piece? _____

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Name _____ Date _____

4. A. Three blacks cover what part of an orange piece? _____

B. How do you know what numerator to use?

C. How do you know what denominator to use?

5. A. Write $\frac{17}{6}$ as a mixed number. Show or tell how you know your answer is correct.

B. Write $2\frac{5}{6}$ as an improper fraction. Show or tell how you know your answer is correct.

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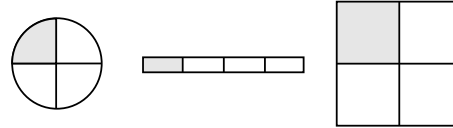
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Teacher Guide

Fraction Quiz (TG pp. 1–3)

Questions 1–7

1. A. Answers will vary. Possible sketches include:



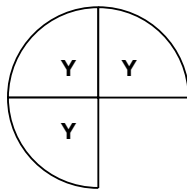
- B. No; Unit wholes are different sizes.
2. A. $\frac{1}{3}$ one-third
 B. $\frac{3}{4}$ three-fourths
 C. $\frac{2}{1}$ or 2, two
3. A. A yellow piece
 B. A pink piece
 C. An orange piece
4. A. $\frac{3}{4}$
 B. Answers will vary. Students may respond that they used three black pieces, or that three represents the number of parts to consider.
 C. Answers will vary. Students may respond that four black pieces would cover the entire orange piece, or that the orange piece divides into four equal parts that are the same size as a black piece.
5. A. $5\frac{2}{3}$; Explanations may vary. Students may show a sketch of orange circle pieces grouped into five unit-whole circles with two pieces left over. They may compute by dividing 17 by 3.
 B. $\frac{17}{6}$; Explanations may vary. Students may show a sketch of two unit-whole circles constructed from 12 aqua circle pieces with five additional pieces totaling 17. They may use multiplication to find that if one whole is $\frac{6}{6}$, then three wholes are $\frac{18}{6}$, and one sixth less is $\frac{17}{6}$.

6. A. Answers will vary but may include: $\frac{6}{10}$, $\frac{9}{15}$, $\frac{12}{20}$, $\frac{15}{25}$

B. $\frac{2}{3}$

C. Possible response: I used my circle pieces to show $\frac{9}{12}$. I saw that $\frac{9}{12}$ is the same as $\frac{3}{4}$, or 9 black pieces are the same as 3 yellow pieces. I then checked to see if $\frac{15}{20}$ was equal to $\frac{3}{4}$. I saw that you can divide both the numerator and denominator by 5. When you do this: $\frac{15}{20} \div \frac{5}{5} = \frac{3}{4}$ so $\frac{3}{4} = \frac{9}{12} = \frac{15}{20}$.

7. A.

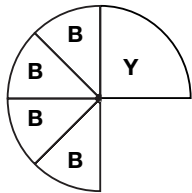


$$\frac{3}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$$

or

$$\frac{3}{4} = 3 \times \frac{1}{4}$$

B. Answers will vary. One possible solution:

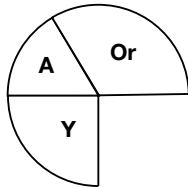


$$\frac{3}{4} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{4}$$

or

$$\frac{3}{4} = \frac{4}{8} + \frac{1}{4}$$

C. Answers will vary. One possible solution:



$$\frac{3}{4} = \frac{1}{4} + \frac{1}{6} + \frac{1}{3}$$

Name _____ Date _____

6. A. Find 4 fractions that are equivalent to $\frac{3}{5}$.

B. Complete this number sentence to make it true:

$$\frac{\square}{\square} = \frac{6}{9} = \frac{10}{15}$$

C. Show or tell how you know that $\frac{3}{5} = \frac{18}{25}$.

7. A. Show $\frac{3}{4}$ of the red circle using circle pieces of only one color. Make a sketch and write a number sentence for your solution.

B. Show $\frac{3}{4}$ of the red circle using circle pieces of two different colors. Make a sketch and write a number sentence for your solution.

C. Show $\frac{3}{4}$ of the red circle using circle pieces of three different colors. Make a sketch and write a number sentence for your solution.

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