

### Wholes and Parts

**Discuss**

Irma told her friends that she ate half of a cake yesterday. They all had a different idea about what that meant.

1. If each student shown here is thinking of  $\frac{1}{2}$  of a cake, why are all the pieces of cake different sizes?

**Numerators and Denominators**  
 The numerator and denominator of a fraction work together to tell the size of the number represented by the fraction.

$$\frac{3}{4} \begin{array}{l} \leftarrow \text{Numerator} \\ \leftarrow \text{Denominator} \end{array}$$

The **denominator** of a fraction tells us to divide the whole into that many equal parts. The 4 in the fraction shown above tells us to divide the whole into four equal parts (fourths).

The **numerator** tells us the number of parts to consider, so the 3 tells us we are interested in three of the parts.

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#### Wholes and Parts (SG pp. 58–63) Questions 1–18

1. \* Each student is thinking of a different size cake.

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$\frac{2}{3}$  of a cake       $\frac{3}{4}$  of the students are wearing glasses.       $\frac{3}{4}$  of a hexagon

2. When you read a fraction:

- What information does the denominator give you?
- What information does the numerator give you?

3. If each fraction  $\frac{1}{4}$  represents  $\frac{1}{4}$  of a cake, what other information is necessary to know the size of this piece of cake?

4. Jerome divided a cake into four pieces as shown on the left. David divided the same size cake into four pieces as shown on the right.

**Jerome's cake**

**David's cake**

- Who divided the cake fairly? Show or tell how you know.
- Which cake is divided into fourths? Tell why it shows fourths.

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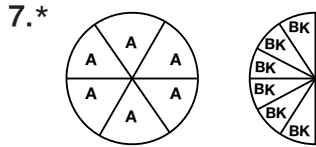
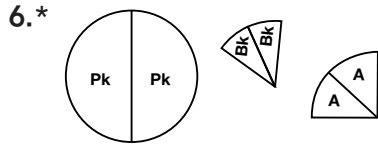
- The denominator tells you into how many parts the whole is divided. For example, the cake is divided into 4 equal pieces.
  - The numerator tells you the number of parts of the whole we are interested in. For example, we ate 3 of the 4 pieces.)
- The size of the whole cake.
- \* Jerome divided the cake fairly. The 4 pieces in Jerome's cake are all the same size. David's cake is divided into 4 pieces, but the pieces are not the same size.
  - \* I know Jerome's cake is divided into fourths because he first divided the cake in half, then the halves in half. There are four equal-size pieces.

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

5. A. aqua  
 B. orange  
 C. 1 orange, 2 aquas, or 4 blacks  
 D. 2 oranges, 4 aquas, or 8 blacks



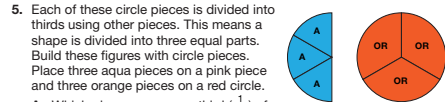
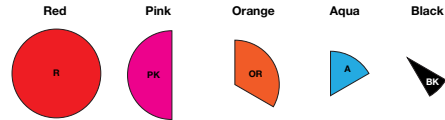
8. A.  $\frac{5}{12}$   
 B. The denominator tells you how many pieces the shape is divided into and the numerator tells you the number of parts to consider. In this case, the unit whole is divided into 12 pieces. You have 5 of those pieces, so  $\frac{5}{12}$  of the unit whole.  
 C. five-twelfths  
 D.  $\frac{5}{6}$ ; Six black pieces fit on a pink and you have 5 of them.  
 E. Five-sixths

9. A.  $\frac{2}{12}$   
 B.  $\frac{1}{6}$   
 C.  $\frac{2}{3}$   
 D.  $\frac{4}{6}$   
 E.  $\frac{1}{2}$   
 F.  $\frac{3}{6}$   
 G.\*  $\frac{2}{2}$  or 1  
 H.\*  $\frac{3}{2}$  or  $1\frac{1}{2}$   
 I.  $\frac{4}{3}$  or  $1\frac{1}{3}$   
 J.  $\frac{2}{1}$  or 2

10. A.  $\frac{2}{3}$  and  $\frac{4}{6}$ ,  $\frac{1}{2}$  and  $\frac{3}{6}$   
 B.  $1\frac{1}{2}$  and  $1\frac{1}{3}$   
 C.  $\frac{2}{2}$  and  $\frac{2}{1}$   
 11. A.  $\frac{1}{4}$ ; one-fourth  
 B.  $\frac{2}{4}$ ; two-fourths  
 C.  $\frac{1}{2}$ ; one-half  
 D.  $\frac{3}{4}$ ; three-fourths  
 E.  $\frac{3}{2}$  or  $1\frac{1}{2}$ ; three-halves or one and one-half  
 F.  $\frac{4}{4}$  or 1; four-fourths or one  
 G.  $\frac{2}{1}$  or 2; two  
 H.  $\frac{3}{1}$  or 3; three

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

You will use circles and pieces of circles to study fractions. Use all the pieces with these colors in your fraction circle set to answer Questions 5–12.



5. Each of these circle pieces is divided into thirds using other pieces. This means a shape is divided into three equal parts. Build these figures with circle pieces. Place three aqua pieces on a pink piece and three orange pieces on a red circle.
- A. Which piece covers one-third ( $\frac{1}{3}$ ) of the pink piece?  
 B. Which piece covers  $\frac{1}{3}$  of the red circle?  
 C. Find all the ways to cover two-thirds ( $\frac{2}{3}$ ) of the pink piece using one color.  
 D. Find all the ways to cover  $\frac{2}{3}$  of the red circle using one color.
6. A red circle covered with two pink pieces shows a unit whole divided into halves. What other ways can you show a unit whole divided into halves using the fraction pieces?
7. Show a unit whole divided into sixths as many ways as you can using the circle pieces.



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8. A. Five blacks is what fraction of the red circle?  
 B. When you wrote the fraction as a number, how did you know what denominator to use? How did you know what numerator to use?  
 C. Write the fraction in Question 8A in words.  
 D. Five blacks is what fraction of a pink piece? Tell how you know.  
 E. Write the fraction in Question 8D in words.
9. If the red circle is the unit whole, write a number for each of the following:  
 A. two blacks  
 B. one aqua  
 C. two oranges  
 D. four aquas  
 E. one pink  
 F. three aquas  
 G. two pinks  
 H. three pinks  
 I. four oranges  
 J. two red circles
10. A. Which pairs of fractions in Question 9 cover the same area?  
 B. Which fractions in Question 9 can be written as a mixed number?  
 C. Which fractions in Question 9 represent a whole number?
11. If the orange piece is the unit whole, write a fraction for each of the pieces listed below. Then write the number in words.
- A. one black  
 B. two blacks  
 C. one aqua  
 D. three blacks  
 E. three aquas  
 F. four blacks  
 G. two oranges  
 H. one red circle

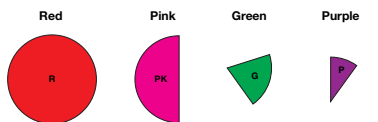


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## Answer Key • Lesson 2: Wholes and Parts

12. A. If a black piece is  $\frac{1}{2}$ , what is the unit whole?  
 B. If a black piece is  $\frac{1}{4}$ , what is the unit whole?  
 C. If a black piece is  $\frac{1}{6}$ , what is the unit whole?  
 D. If a black piece is  $\frac{1}{12}$ , what is the unit whole?



Use only the red, pink, green, and purple pieces to answer Questions 13–18.

13. A. A purple piece covers what fraction of a green piece?  
 B. A purple piece covers what fraction of a pink piece?  
 C. A purple piece covers what fraction of the red circle? Tell how you know.
14. Cover the pink piece with three pieces using two colors.  
 A. Show or tell what pieces you used.  
 B. Does your representation show the pink piece divided in thirds? Why or why not?
15. A. A green piece is  $\frac{1}{5}$  of what unit whole?  
 B. A green piece is  $\frac{2}{5}$  of what unit whole? Show or tell how you know.
16. A. Three purple pieces cover what part of a pink piece?  
 B. When you wrote the fraction as a number, how did you know what denominator to use? How did you know what numerator to use?  
 C. Three purple pieces cover what part of a red piece?  
 D. When you wrote the fraction as a number, how did you know what denominator to use? How did you know what numerator to use?

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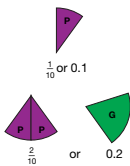
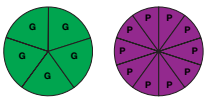
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17. If the red circle is the unit whole, write the fraction as a number for each set of pieces.
- A. four purple pieces  
 B. two green pieces  
 C. a pink piece  
 D. five purple pieces  
 E. four green pieces  
 F. eight purple pieces  
 G. Look at Questions 17A and B. Compare the fractions.  
 What do you notice?  
 H. Do you see this in any other fractions?



18. We can use decimals to represent the fractions in Question 17. For example, we can write: 0.1 (one-tenth) for one purple piece, 0.2 (two-tenths) for two purple pieces, or 0.2 for one green piece. Write decimals for the following:
- A. four purple pieces  
 B. two green pieces  
 C. a pink piece  
 D. five purple pieces  
 E. four green pieces  
 F. eight purple pieces



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12. A. aqua  
 B. orange  
 C. pink  
 D. red
13. A.  $\frac{1}{2}$   
 B.  $\frac{1}{5}$   
 C.  $\frac{1}{10}$ ; Ten purple pieces cover a red piece so one purple piece is  $\frac{1}{10}$  of a red circle.
14. A. two greens and one purple  
 B. This does not show thirds because the three pieces are not equal size.
15. A. a red circle  
 B. pink; Possible response: Five purple pieces cover a pink. Two pieces show  $\frac{2}{5}$  of the pink piece.
16. A.  $\frac{3}{5}$   
 B. The pink piece is divided into 5 equal parts, or purple pieces, and this is the denominator. The numerator shows the three pieces you want to consider.  
 C.  $\frac{3}{10}$   
 D. The red circle can be covered by 10 purple pieces, so this is the denominator. The numerator shows the three pieces you want to consider.

17. A.  $\frac{4}{10}$   
 B.  $\frac{2}{5}$   
 C.  $\frac{1}{2}$   
 D.  $\frac{5}{10}$   
 E.  $\frac{4}{5}$   
 F.  $\frac{8}{10}$   
 G. The fractions are equivalent.  
 H.  $\frac{4}{5}$  and  $\frac{8}{10}$  are also equivalent.
18. A. 0.4  
 B. 0.4  
 C. 0.5  
 D. 0.5  
 E. 0.8  
 F. 0.8

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