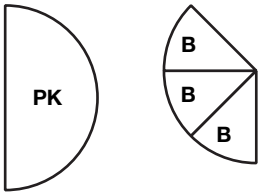
Student Guide

Add Fractions (SG pp. 89–98)
Questions 1–18

1. **A.** Possible response:



B. Yes. 1 pink is half a box, 3 blue is less than half; together they will fit in one box.

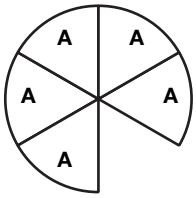
C. $\frac{7}{8}$ pizza; Possible explanation: One more piece would make a whole pizza.

D. Number sentences will vary. Possible responses: $\frac{1}{2}+\frac{3}{8}=\frac{7}{8}$; $\frac{4}{8}+\frac{3}{8}=\frac{7}{8}$; $\frac{8}{8}-\frac{1}{8}=\frac{7}{8}$

2. **A.** Answers will vary. The methods are alike in that they both reach the same answer. Romesh exchanged pieces so he would have all one color and then added. Kathy reasoned using benchmarks such as $\frac{1}{2}$ and 1. The whole pizza is 8 eighths. One piece is missing, so $\frac{7}{8}$ remains.

B. Answers will vary.

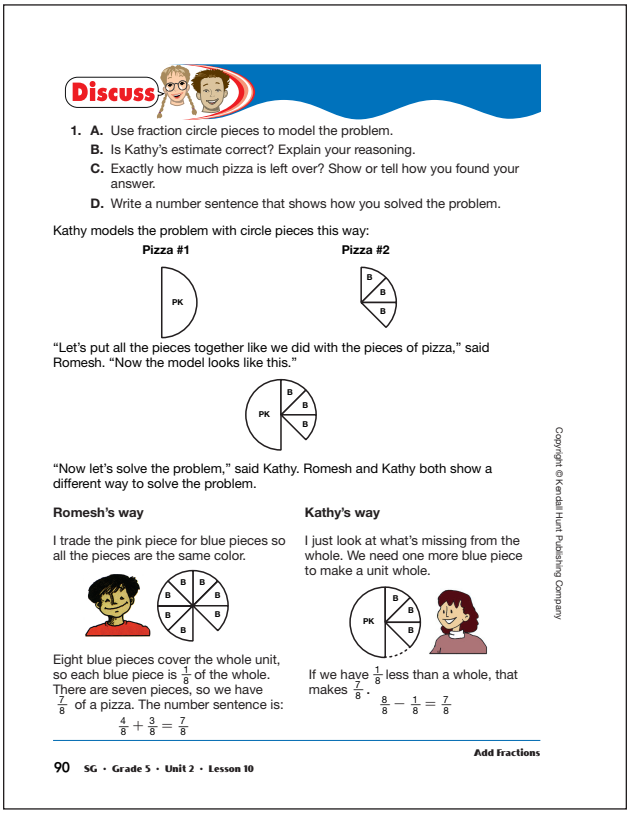
3. **A.***



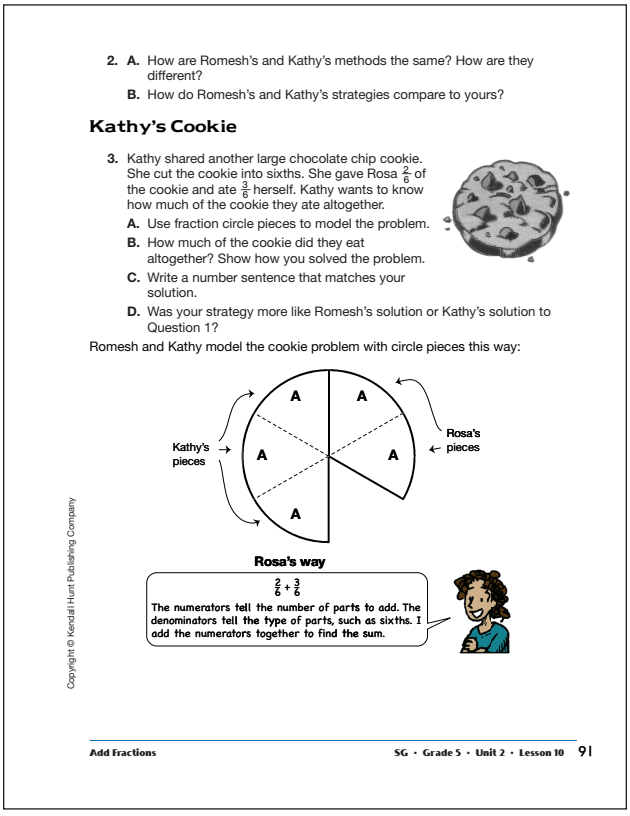
B. $\frac{5}{6}$; Possible responses: I added $\frac{2}{6}$ and $\frac{3}{6}$. Or, I saw that one one of the six pieces was missing, so I subtracted, $\frac{6}{6}-\frac{1}{6}=\frac{5}{6}$.

C. $\frac{2}{6}+\frac{3}{6}=\frac{5}{6}$ or $\frac{6}{6}-\frac{1}{6}=\frac{5}{6}$

D. Answers will vary; Romesh used addition and Kathy used subtraction.



***Student Guide* - Page 90**



***Student Guide* - Page 91**

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

Romesh and Kathy both show a way to solve the cookie problem.

Romesh's way

Since all the pieces are the same color, I just add them all up. Aqua pieces are $\frac{1}{6}$ of the whole circle, so I can write this number sentence:

$\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$

Kathy's way

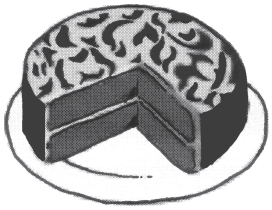
I looked at the piece that was missing from the whole unit. It's the same size as an aqua piece. That means there is one-sixth less than a whole, or $\frac{5}{6}$.

$\frac{6}{6} - \frac{1}{6} = \frac{5}{6}$

4. Whose method makes more sense to you, Romesh's or Kathy's? Explain why you think so.

Kathy's Cake

5. Kathy's family made a cake. After dinner, Kathy and her family ate $\frac{1}{3}$ of the cake. Later in the evening, they ate another $\frac{1}{4}$ of the cake. Kathy wants to know how much of the cake they ate in all.
   - **A.** Use fraction circle pieces to model the problem.
   - **B.** How much of the cake did they eat? Show how you solved the problem.
   - **C.** Write a number sentence that matches your solution.



***Student Guide* - Page 92**

Julia's way

I solve $\frac{1}{3} + \frac{1}{4}$ another way. It's easier to add when all the pieces are the same color or when the denominators are the same. To find the same denominator, I replace the pieces with all the same color. Then I can add fractions with the same denominators.

Julia finds equivalent fractions with common denominators.

Can I rename $\frac{1}{3}$ as fourths?

$\frac{1 \times ?}{3 \times ?} = \frac{?}{4}$ No

To solve $\frac{1}{4} + \frac{1}{3}$, I find $\frac{1}{4} = \frac{3}{12}$ and $\frac{1}{3} = \frac{4}{12}$.

$\frac{3}{12} + \frac{4}{12} = \frac{7}{12}$

Can I rename $\frac{1}{3}$ as sixths?

$\frac{1 \times 2}{3 \times 2} = \frac{2}{6}$ Yes

Can I rename $\frac{1}{4}$ as sixths?

$\frac{1 \times ?}{4 \times ?} = \frac{?}{6}$ No

Can I rename both $\frac{1}{4}$ and $\frac{1}{3}$ as twelfths?

$\frac{1 \times ?}{4 \times ?} = \frac{?}{12}$ $\frac{1 \times 3}{4 \times 3} = \frac{3}{12}$ Yes

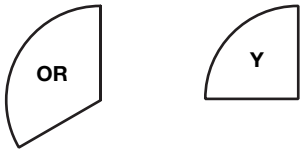
$\frac{1 \times ?}{3 \times ?} = \frac{?}{12}$ $\frac{1 \times 4}{3 \times 4} = \frac{4}{12}$ Yes

6. Discuss with a partner how the problems in Questions 1, 3, and 5 compare to each other.
   - **A.** What is the same about each problem?
   - **B.** What is different about each problem?
   - **C.** In which problem(s) does Romesh trade fraction pieces to get one color? Why does he have to trade them?
   - **D.** In which problem(s) does Romesh not have to trade any pieces? Why not?

Use fraction circle pieces to solve the problems on the *Find Fraction Sums 1* pages in the *Student Activity Book*.

***Student Guide* - Page 94**

4. Answers will vary.

5. **A.*** 

   B. $\frac{7}{12}$; Explanations will vary; see discussion and diagrams in the *Student Guide*.

   C. Number sentences will vary. Possible responses: $\frac{3}{12} + \frac{4}{12} = \frac{7}{12}$; $\frac{6}{12} + \frac{1}{12} = \frac{7}{12}$

6. **A.** Answers will vary. Each problem involves adding fractions; each can be solved in more than one way; all three are solved using fraction circle pieces.

   B. Each problem involves different fraction pieces; problems 1 and 5 involve fractions with different denominators; problem 3 involves fractions with the same denominator.

   C. Questions 1 and 5; he trades so he can add like pieces.

   D. Question 3; the pieces are already the same (sixths) so he can add the sixths.

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

7. A. Less than $\frac{1}{2}$ mile

B. $\frac{3}{8}$ mile

8. $\frac{5}{6}$ of his allowance

9. A. $\frac{3}{4}$

B. $\frac{7}{8}$

10. A. Closer to 1 whole acre

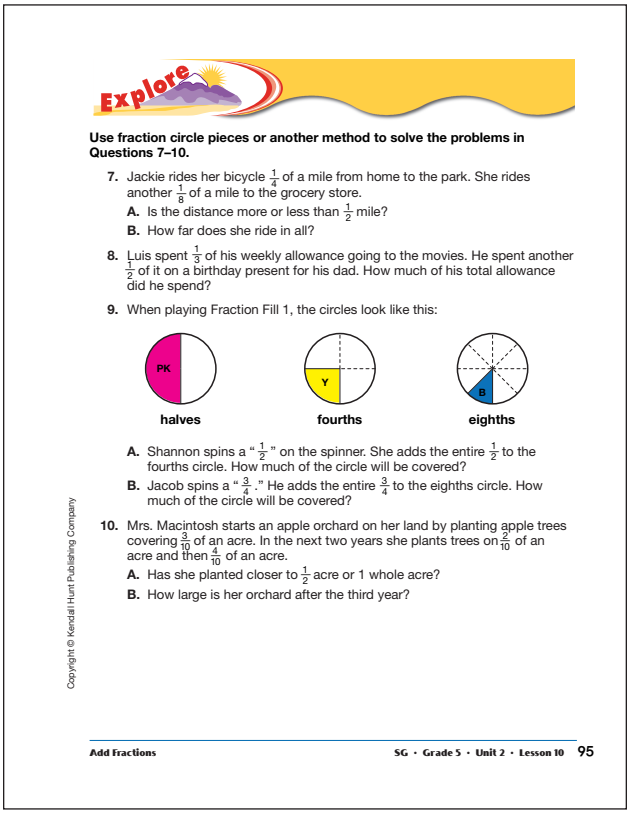
B. $\frac{9}{10}$ acre; $\frac{3}{10} + \frac{2}{10} + \frac{4}{10} = \frac{9}{10}$

11. A. Answers may vary. A student can trade each third (orange) for two sixths (aqua) and trade the half (pink) for 3 sixths. $\frac{4}{6} + \frac{1}{6} + \frac{3}{6} = \frac{8}{6}$, or $1\frac{2}{6}$

B. Aqua

C. Traded for sixths (aqua) rather than twelfths (black) which uses fewer fraction pieces.

12. $\frac{4}{6} + \frac{1}{6} + \frac{3}{6} = \frac{8}{6} = 1\frac{2}{6}$ or $1\frac{1}{3}$



Explore

Use fraction circle pieces or another method to solve the problems in Questions 7–10.

7. Jackie rides her bicycle $\frac{1}{4}$ of a mile from home to the park. She rides another $\frac{1}{8}$ of a mile to the grocery store.

A. Is the distance more or less than $\frac{1}{2}$ mile?

B. How far does she ride in all?

8. Luis spent $\frac{1}{3}$ of his weekly allowance going to the movies. He spent another $\frac{1}{2}$ of it on a birthday present for his dad. How much of his total allowance did he spend?

9. When playing Fraction Fill 1, the circles look like this:

A. Shannon spins a "$\frac{1}{2}$." on the spinner. She adds the entire $\frac{1}{2}$ to the fourths circle. How much of the circle will be covered?

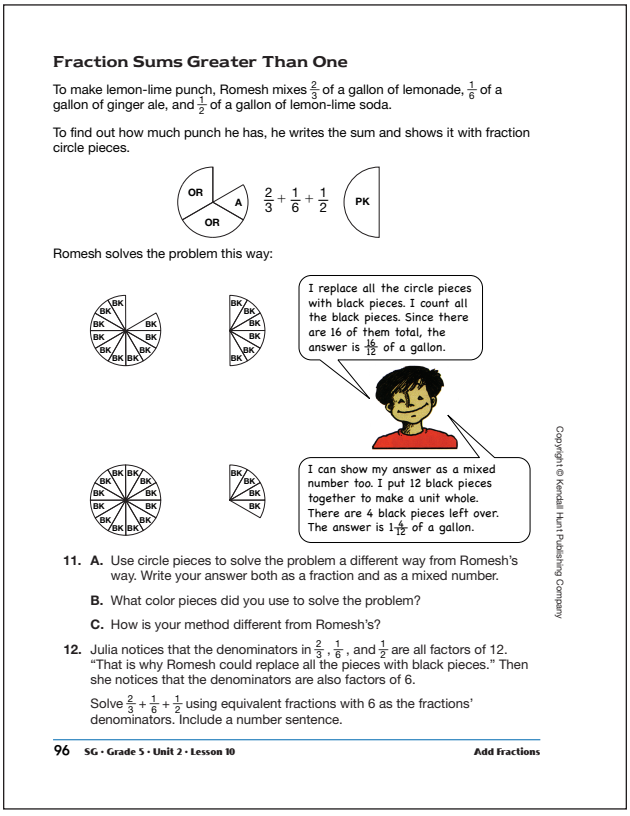
B. Jacob spins a "$\frac{3}{4}$." He adds the entire $\frac{3}{4}$ to the eighths circle. How much of the circle will be covered?

10. Mrs. Macintosh starts an apple orchard on her land by planting apple trees covering $\frac{3}{10}$ of an acre. In the next two years she plants trees on $\frac{2}{10}$ of an acre and then $\frac{4}{10}$ of an acre.

A. Has she planted closer to $\frac{1}{2}$ acre or 1 whole acre?

B. How large is her orchard after the third year?

***Student Guide* - Page 95**



Fraction Sums Greater Than One

To make lemon-lime punch, Romesh mixes $\frac{2}{3}$ of a gallon of lemonade, $\frac{1}{6}$ of a gallon of ginger ale, and $\frac{1}{2}$ of a gallon of lemon-lime soda.

To find out how much punch he has, he writes the sum and shows it with fraction circle pieces.

Romesh solves the problem this way:

11. A. Use circle pieces to solve the problem a different way from Romesh's way. Write your answer both as a fraction and as a mixed number.

B. What color pieces did you use to solve the problem?

C. How is your method different from Romesh's?

12. Julia notices that the denominators in $\frac{2}{3}$, $\frac{1}{6}$, and $\frac{1}{2}$ are all factors of 12. "That is why Romesh could replace all the pieces with black pieces." Then she notices that the denominators are also factors of 6.

Solve $\frac{2}{3} + \frac{1}{6} + \frac{1}{2}$ using equivalent fractions with 6 as the fractions' denominators. Include a number sentence.

***Student Guide* - Page 96**

Use fraction circle pieces to solve the problems on the *Find Fraction Sums 2* pages in the *Student Activity Book*.

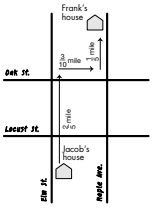
✓ **Check-In: Questions 13-18**

Use circle pieces or another method to solve the problems. Include number sentences.

13. Linda sprints for $\frac{1}{4}$ of a lap around the track, jogs for $\frac{3}{4}$ of a lap, and walks for $\frac{2}{3}$ of a lap. How many total laps does Linda complete?

14. Frank writes these directions for Jacob to get to his house:

Go $\frac{2}{5}$ of a mile on Elm Street to Oak Street. Take a right on Oak Street and go $\frac{3}{10}$ of a mile to Maple Avenue. Take a left on Maple Avenue and go $\frac{1}{5}$ of a mile to my house.



How far is it from Jacob's house to Frank's house?

15. Jessie uses a rain gauge to measure rainfall in her yard for 5 days. She recorded data in the table.

How much rain fell during the 5 days?

Rainfall for 5 Days

Day	Rainfall in Inches
Monday	0
Tuesday	$\frac{7}{12}$
Wednesday	$\frac{1}{3}$
Thursday	0
Friday	$\frac{1}{6}$

***Student Guide* - Page 97**

16. For each problem below:

- Use benchmarks of 0, $\frac{1}{2}$, and 1 to estimate the sum.
- Use fraction circle pieces or another method to find an exact answer.
- Write a number sentence to represent your solution.

A. $\frac{5}{12}+\frac{1}{4}$ **B.** $\frac{2}{6}+\frac{3}{6}$ **C.** $\frac{2}{4}+\frac{2}{3}$

D. $\frac{11}{12}+\frac{2}{3}$ **E.** $\frac{1}{3}+\frac{5}{6}+\frac{1}{3}$ **F.** $\frac{1}{2}+\frac{1}{3}+\frac{1}{4}$

G. Use Julia's method to solve Question 16E.

17. Jerome measures a stack of three tiles to be $\frac{3}{8}$ of an inch tall. If he stacked 10 tiles on top of each other, how tall would the stack be?

18. Use Julia's method of finding equivalent fractions with common denominators to solve $\frac{3}{4}+\frac{1}{2}+\frac{2}{8}$. Include a number sentence.

***Student Guide* - Page 98**

13. $1\frac{2}{3}$ laps

14. $\frac{9}{10}$ mile

15. $\frac{13}{12}$ inches or $1\frac{1}{12}$ inches

16. Number sentences will vary. Two possible solutions are given for each problem.

A. Between $\frac{1}{2}$ and 1; $\frac{5}{12}+\frac{1}{4}=\frac{8}{12}$, $\frac{5}{12}+\frac{3}{12}=\frac{8}{12}$

B. Close to 1; $\frac{2}{6}+\frac{3}{6}=\frac{5}{6}$, $\frac{2}{6}+\frac{1}{2}=\frac{5}{6}$

C. More than 1; $\frac{2}{4}+\frac{2}{3}=\frac{14}{12}$ or $1\frac{2}{12}$, $\frac{6}{12}+\frac{8}{12}=\frac{14}{12}$ or $1\frac{2}{12}$

D. More than 1; $\frac{11}{12}+\frac{2}{3}=\frac{19}{12}$ or $1\frac{7}{12}$, $\frac{11}{12}+\frac{8}{12}=\frac{19}{12}$ or $1\frac{7}{12}$

E.* More than 1; $\frac{1}{3}+\frac{5}{6}+\frac{1}{3}=\frac{9}{6}$ or $1\frac{3}{6}$, $\frac{2}{6}+\frac{5}{6}+\frac{2}{6}=\frac{9}{6}$ or $1\frac{3}{6}$ or $1\frac{1}{2}$

F.* More than 1; $\frac{1}{2}+\frac{1}{3}+\frac{1}{4}=\frac{13}{12}$ or $1\frac{1}{12}$, $\frac{6}{12}+\frac{4}{12}+\frac{3}{12}=\frac{13}{12}$ or $1\frac{1}{12}$

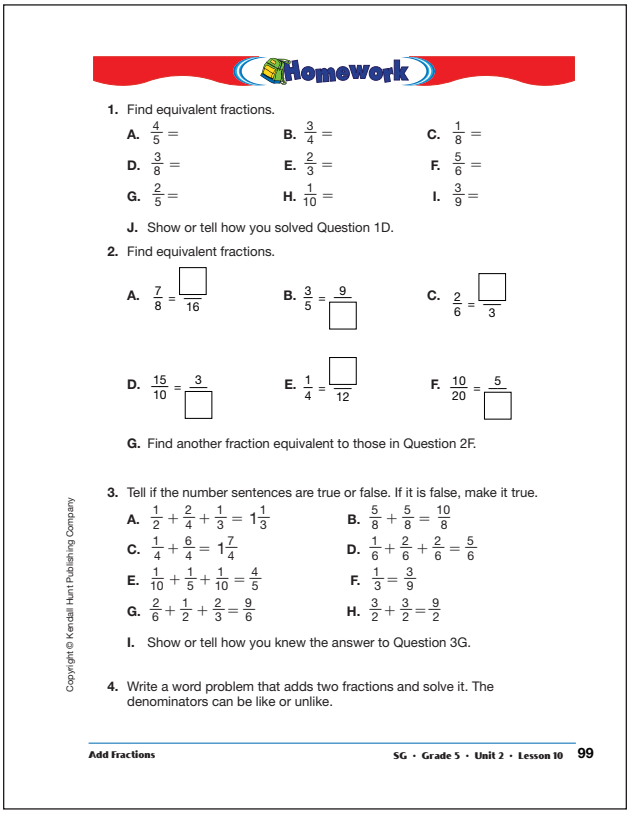
G. $\frac{1}{3}\times\frac{2}{2}=\frac{2}{6}$; $\frac{2}{6}+\frac{5}{6}+\frac{2}{6}=\frac{9}{6}=1\frac{3}{6}$ or $1\frac{1}{2}$

17. $\frac{10}{8}$ or $1\frac{2}{8}$

18. $\frac{6}{8}+\frac{4}{8}+\frac{2}{8}=\frac{12}{8}$ or $1\frac{4}{8}$ or $1\frac{1}{2}$

Homework (SG p. 99)
Questions 1–4

1. Answers for Question 1 may vary. One possible answer is given for each.
   - **A.** $\frac{4}{5} = \frac{8}{10}$
   - **B.** $\frac{3}{4} = \frac{6}{8}$
   - **C.** $\frac{1}{8} = \frac{2}{16}$
   - **D.** $\frac{3}{8} = \frac{6}{16}$
   - **E.** $\frac{2}{3} = \frac{4}{6}$
   - **F.** $\frac{5}{6} = \frac{10}{12}$
   - **G.** $\frac{2}{5} = \frac{4}{10}$
   - **H.** $\frac{1}{10} = \frac{2}{20}$
   - **I.** $\frac{3}{9} = \frac{6}{18}$
   - **J.** Possible response: I multiplied the numerator and the denominator by the same number.
2. **A.** $\frac{7}{8} = \frac{14}{16}$
   - **B.** $\frac{3}{5} = \frac{9}{15}$
   - **C.** $\frac{2}{6} = \frac{1}{3}$
   - **D.** $\frac{15}{10} = \frac{3}{2}$
   - **E.** $\frac{1}{4} = \frac{3}{12}$
   - **F.** $\frac{10}{20} = \frac{5}{10}$
   - **G.** Possible response: $\frac{1}{2}$
3. **A.** true
   - **B.** true
   - **C.** false; $\frac{7}{4}$
   - **D.** true
   - **E.** false; $\frac{4}{10}$ or $\frac{2}{5}$
   - **F.** true
   - **G.** true
   - **H.** false; $\frac{6}{2}$
   - **I.** Possible response: I knew $\frac{1}{2} = \frac{3}{6}$. I multiplied $\frac{2}{3}$ by $\frac{2}{2}$ to get $\frac{4}{6}$. $\frac{2}{6} + \frac{3}{6} + \frac{4}{6} = \frac{9}{6}$ so the number sentence is true.
4. Word problems will vary. Sample problem: Jessie had a bag of mixed candy. $\frac{1}{6}$ of the candy was peppermint, $\frac{1}{4}$ of the candy was gumdrops, and $\frac{1}{3}$ of the candy was butterscotch. The rest of the bag was chocolate. How much of the bag was not chocolate?
   Solution: $\frac{2}{12} + \frac{3}{12} + \frac{4}{12} = \frac{9}{12}$ or $\frac{3}{4}$



Homework

1. Find equivalent fractions.
   - **A.** $\frac{4}{5} =$ **B.** $\frac{3}{4} =$ **C.** $\frac{1}{8} =$
   - **D.** $\frac{3}{8} =$ **E.** $\frac{2}{3} =$ **F.** $\frac{5}{6} =$
   - **G.** $\frac{2}{5} =$ **H.** $\frac{1}{10} =$ **I.** $\frac{3}{9} =$
   - **J.** Show or tell how you solved Question 1D.
2. Find equivalent fractions.
   - **A.** $\frac{7}{8} = \frac{\square}{16}$ **B.** $\frac{3}{5} = \frac{9}{\square}$ **C.** $\frac{2}{6} = \frac{\square}{3}$
   - **D.** $\frac{15}{10} = \frac{3}{\square}$ **E.** $\frac{1}{4} = \frac{\square}{12}$ **F.** $\frac{10}{20} = \frac{5}{\square}$
   - **G.** Find another fraction equivalent to those in Question 2F.
3. Tell if the number sentences are true or false. If it is false, make it true.
   - **A.** $\frac{1}{2} + \frac{2}{4} + \frac{1}{3} = 1\frac{1}{3}$ **B.** $\frac{5}{8} + \frac{5}{8} = \frac{10}{8}$
   - **C.** $\frac{1}{4} + \frac{6}{4} = 1\frac{7}{4}$ **D.** $\frac{1}{6} + \frac{2}{6} + \frac{2}{6} = \frac{5}{6}$
   - **E.** $\frac{1}{10} + \frac{1}{5} + \frac{1}{10} = \frac{4}{5}$ **F.** $\frac{1}{3} = \frac{3}{9}$
   - **G.** $\frac{2}{6} + \frac{1}{2} + \frac{2}{3} = \frac{9}{6}$ **H.** $\frac{3}{2} + \frac{3}{2} = \frac{9}{2}$
   - **I.** Show or tell how you knew the answer to Question 3G.
4. Write a word problem that adds two fractions and solve it. The denominators can be like or unlike.

Add Fractions SG • Grade 5 • Unit 2 • Lesson 10 99

***Student Guide* - Page 99**