Student Guide

Questions 1–19 (SG pp. 316–318)

1. oatmeal cookie recipe calls for more sugar

2. Keenya lives closer

3. Answers will vary. Possible responses:

   A. $\frac{1}{3}, \frac{1}{4}, \frac{1}{8}, \frac{3}{8}, \frac{4}{9}$

   B. $\frac{2}{4}, \frac{3}{6}, \frac{4}{8}, \frac{5}{10}, \frac{6}{12}$

   C. $\frac{2}{3}, \frac{3}{4}, \frac{3}{5}, \frac{4}{5}, \frac{5}{6}$

4.* A fraction is less than (equal to, greater than) $\frac{1}{2}$ if its numerator is less than half (equal to, greater than) half its denominator.

5. Answers may vary as shown in the answers to 5A and 5B.

   A. $\frac{1}{4} < \frac{1}{2}$ or $\frac{1}{2} > \frac{1}{4}$ B. $\frac{2}{3} > \frac{1}{2}$ or $\frac{1}{2} < \frac{2}{3}$

   C. $\frac{1}{2} > \frac{2}{5}$ D. $\frac{1}{2} = \frac{3}{6}$

   E. $\frac{5}{12} < \frac{1}{2}$ F. $\frac{6}{9} > \frac{1}{2}$

6. A. $=$ B. $<$

   C. $<$ D. $<$

   E. $<$ F. $>$

7. A. $\frac{3}{4} > \frac{1}{3}$ B. $\frac{2}{5} < \frac{7}{10}$

   C. $\frac{5}{8} > \frac{5}{12}$ D. $\frac{2}{4} = \frac{6}{12}$

   E. $\frac{3}{9} < \frac{2}{3}$ F. $\frac{3}{5} > \frac{1}{4}$

8. A, C, D; Possible answers for G:
   B: $\frac{1}{4} + \frac{2}{4} > \frac{1}{2}$, E: $\frac{1}{8} \times 3 < \frac{6}{8}$, F: $\frac{6}{12} + \frac{6}{12} = \frac{3}{6} + \frac{3}{6}$

9. A.* $\frac{1}{6}, \frac{1}{3}, \frac{1}{2}$

   B.* $\frac{3}{12}, \frac{3}{5}, \frac{3}{4}$

   C.* $\frac{2}{10}, \frac{2}{9}, \frac{2}{4}$

10.* When the numerators are the same, the fraction with the largest denominator is the smallest fraction. Larger denominators mean the fraction strip is divided into smaller pieces.

11. A.* $\frac{1}{5}, \frac{2}{5}, \frac{4}{5}$

    B.* $\frac{2}{8}, \frac{6}{8}, \frac{7}{8}$

    C.* $\frac{1}{10}, \frac{2}{10}, \frac{3}{10}$

Explore

Use the Fraction Chart you made to complete the following questions.

1. Ana has a recipe for oatmeal cookies that calls for $\frac{3}{4}$ cup of sugar. Her brownie recipe calls for $\frac{1}{2}$ cup of sugar. Which recipe calls for more sugar?

2. Roberto walks $\frac{7}{8}$ of a mile to school. Keenya walks $\frac{5}{6}$ of a mile to school. Who lives closer to the school, Keenya or Roberto?

Comparing Fractions to $\frac{1}{2}$

3. Look at your Fraction Chart.
   A. Name several fractions that are less than $\frac{1}{2}$.
   B. Name several fractions that are equal to $\frac{1}{2}$.
   C. Name several fractions that are greater than $\frac{1}{2}$.

4. Describe a pattern that tells whether a fraction is less than, equal to, or greater than $\frac{1}{2}$.

5. Compare the following fractions to $\frac{1}{2}$. Use the symbols $<$, $=$, or $>$ in your answers.
   Example: $\frac{1}{2} < \frac{5}{8}$
   A. $\frac{1}{4}$ B. $\frac{2}{3}$ C. $\frac{2}{5}$
   D. $\frac{3}{6}$ E. $\frac{5}{12}$ F. $\frac{6}{9}$

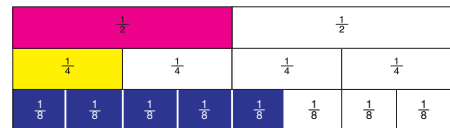6. Use your Fraction Chart to compare the following fractions. Use the symbols $<$, $>$, or $=$ in your answers.
   A. $\frac{1}{2} + \frac{1}{2} \bigcirc 1$ B. $\frac{1}{2} \bigcirc \frac{1}{3} + \frac{1}{3}$ C. $\frac{1}{4} + \frac{1}{4} \bigcirc \frac{1}{3} + \frac{1}{3}$
   D. $\frac{1}{2} \bigcirc \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$ E. $\frac{5}{8} \bigcirc \frac{2}{4} + \frac{2}{4}$ F. $\frac{1}{2} + \frac{1}{2} \bigcirc \frac{6}{12}$

Comparing Fractions

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Using $\frac{1}{2}$ as a Benchmark to Compare Fractions
To compare two fractions, it sometimes helps to first compare them to $\frac{1}{2}$. For example, $\frac{1}{4}$ is less than $\frac{1}{2}$ and $\frac{6}{8}$ is greater than $\frac{1}{2}$. From this, we know that $\frac{1}{4}$ is less than $\frac{6}{8}$.

7. Use $\frac{1}{2}$ as a benchmark or your Fraction Chart to compare the following pairs of fractions. Write number sentences using $<$, $>$, or $=$.
   A. $\frac{3}{4}, \frac{1}{3}$ B. $\frac{2}{5}, \frac{7}{10}$ C. $\frac{5}{8}, \frac{5}{12}$
   D. $\frac{2}{4}, \frac{6}{12}$ E. $\frac{3}{9}, \frac{2}{3}$ F. $\frac{3}{5}, \frac{1}{4}$

8. Which number sentences are true?
   A. $\frac{5}{6} > \frac{5}{10}$ B. $\frac{1}{4} + \frac{2}{4} < \frac{1}{2}$ C. $\frac{3}{6} = \frac{1}{6} \times 3$
   D. $\frac{1}{4} + \frac{1}{4} < \frac{1}{2} \times 3$ E. $\frac{1}{8} \times 3 > \frac{6}{8}$ F. $\frac{6}{12} + \frac{6}{12} > \frac{3}{6} + \frac{3}{6}$
   G. Pick a false number sentence from above and make it true.

Same Numerator or Same Denominator

9. Use your Fraction Chart to put the following fractions in order from smallest to largest.
   A. $\frac{1}{3}, \frac{1}{6}, \frac{1}{2}$ B. $\frac{3}{5}, \frac{3}{4}, \frac{3}{12}$ C. $\frac{2}{10}, \frac{2}{4}, \frac{2}{9}$

10. Use your answers from Question 9 to help you answer this question: If two or more fractions have the same numerator, how can you tell which one is smallest? Explain.

11. Put the following fractions in order from smallest to largest.
    A. $\frac{1}{5}, \frac{4}{5}, \frac{2}{5}$ B. $\frac{6}{8}, \frac{2}{8}, \frac{7}{8}$ C. $\frac{3}{10}, \frac{2}{10}, \frac{1}{10}$

12. Use your answers from Question 11 to help you answer this question: If two or more fractions have the same denominator, how can you tell which one is smallest? Explain.

Comparing Fractions

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

13. Put the following fractions in order from smallest to largest.
  A. $\frac{4}{6}, \frac{1}{3}, \frac{1}{2}$ **B.** $\frac{7}{9}, \frac{4}{10}, \frac{3}{4}$ **C.** $\frac{3}{5}, \frac{3}{6}, \frac{1}{4}$ **D.** $\frac{5}{6}, \frac{5}{12}, \frac{5}{8}$

14. Explain your strategies for Questions 13A and 13D.

15. Put the following items in order from smallest to largest.
  A. $\frac{1}{10} + \frac{1}{10}, \frac{2}{5}, \frac{3}{10}$ **B.** $\frac{3}{3}, \frac{1}{3} + \frac{1}{3}, \frac{1}{2}$ **C.** $\frac{4}{12}, \frac{3}{6}, \frac{1}{12} + \frac{1}{12}$

16. Complete the number sentences by using the symbols <, >, or = in your answers.
  A. $\frac{1}{3} + \frac{1}{3}$ ◯ $3 \times \frac{1}{6}$ **B.** $2 \times \frac{1}{2}$ ◯ $\frac{1}{2} + \frac{1}{2}$ **C.** $\frac{2}{10}$ ◯ $\frac{1}{2} + \frac{1}{2}$

  D. $\frac{6}{12}$ ◯ $6 \times \frac{1}{12}$ **E.** $\frac{1}{9} \times 9$ ◯ $\frac{1}{2}$ **F.** $2 \times \frac{1}{4}$ ◯ $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$

  G. For Question 16C, Romesh says $\frac{2}{10} = \frac{1}{5} + \frac{1}{5}$. Do you agree? Why or why not?

✓ **Check-In: Questions 17–19**

17. Put the following fractions in order from smallest to largest. Be prepared to explain your strategies.
  A. $\frac{7}{10}, \frac{3}{6}, \frac{1}{4}$ **B.** $\frac{4}{6}, \frac{2}{6}, \frac{5}{6}$ **C.** $\frac{2}{3}, \frac{1}{5}, \frac{7}{8}$
  D. $\frac{4}{6}, \frac{4}{9}, \frac{4}{12}$ **E.** $\frac{4}{8}, \frac{3}{6}, \frac{5}{10}$ **F.** $\frac{3}{4}, \frac{5}{12}, \frac{1}{3}$

18. A. Explain how you can solve Question 17A using a benchmark of $\frac{1}{2}$.

  B. Explain your strategy for solving Question 17E.

19. Compare the following items. Write a sentence for each one using <, >, or =.
  A. $\frac{4}{12}$ ◯ $\frac{1}{4} + \frac{1}{4}$ **B.** $\frac{4}{5}$ ◯ $\frac{4}{8}$ **C.** $\frac{1}{8} + \frac{1}{8}$ ◯ $2 \times \frac{1}{8}$
  D. $\frac{2}{2}$ ◯ $\frac{2}{4}$ **E.** $\frac{5}{10}$ ◯ $\frac{1}{6} + \frac{1}{6} + \frac{1}{6}$ **F.** $\frac{2}{12}$ ◯ $\frac{1}{6} + \frac{1}{6}$
  G. $7 \times \frac{1}{8}$ ◯ $\frac{1}{6} \times 5$ **H.** $3 \times \frac{1}{12}$ ◯ $2 \times \frac{1}{8}$ **I.** $4 \times \frac{1}{10}$ ◯ $8 \times \frac{1}{5}$

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12.* When the denominators are the same, the fraction with the largest numerator is the largest fraction.

13. A.* $\frac{1}{3}, \frac{1}{2}, \frac{4}{6}$ **B.** $\frac{4}{10}, \frac{3}{4}, \frac{7}{9}$
  C. $\frac{1}{4}, \frac{3}{5}, \frac{5}{6}$ **D.** $\frac{5}{12}, \frac{5}{8}, \frac{5}{6}$

14.* Possible strategies for *Question 13A:*
  Use a Fraction Chart. Or, use $\frac{1}{2}$ as a benchmark. $\frac{1}{3}$ is less than $\frac{1}{2}$ and $\frac{4}{6}$ is greater than $\frac{1}{2}$, so $\frac{1}{3} < \frac{1}{2} < \frac{4}{6}$.

  Possible strategies for *Question 13D:*
  Use a Fraction Chart. Or, since all the fractions have the same numerator, the fractions with the larger denominators are the smaller fractions, so that $\frac{5}{12} < \frac{5}{8} < \frac{5}{6}$.

15. A. $\frac{1}{10} + \frac{1}{10}, \frac{3}{10}, \frac{2}{5}$
  B. $\frac{1}{2}, \frac{1}{3} + \frac{1}{3}, \frac{3}{3}$
  C. $\frac{1}{12} + \frac{1}{12}, \frac{4}{12}, \frac{3}{6}$

16. A. >   **B.** =
  C. <   **D.** =
  E. >   **F.** <

  G. No, Romesh is incorrect. $\frac{1}{5} + \frac{1}{5} = \frac{2}{5}$

17. A. $\frac{1}{4}, \frac{3}{6}, \frac{7}{10}$ **B.** $\frac{2}{6}, \frac{4}{6}, \frac{5}{6}$
  C. $\frac{1}{5}, \frac{2}{3}, \frac{7}{8}$ **D.** $\frac{4}{12}, \frac{4}{9}, \frac{4}{6}$
  E. They are all equal to $\frac{1}{2}$; they are all equivalent.
  F. $\frac{1}{3}, \frac{5}{12}, \frac{3}{4}$

18. A. Answers will vary. $\frac{1}{4}, \frac{3}{6}, \frac{7}{10}$. A possible response: $\frac{3}{6}$ is equivalent to $\frac{1}{2}$ because 3 is half of 6; $\frac{1}{4}$ is less than $\frac{1}{2}$ because fourths are smaller than halves; $\frac{7}{10}$ is greater than $\frac{1}{2}$ because 7 is more than 5, which is half of 10.

  B. Answers will vary. A possible response: using the Fraction Chart, they all line up as equivalent to $\frac{1}{2}$.

19. A. <   **B.** >   **C.** =
  D. >   **E.** =   **F.** <
  G. >   **H.** =   **I.** <

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

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Homework (SG p. 319)

Questions 1–8

1. $\frac{2}{8}$, $\frac{3}{12}$

2. Luis

3. Romesh

4. **A.** Tuesday

   B. Wednesday

5. **A.** $\frac{3}{10} < \frac{1}{2}$

   B. $\frac{4}{8} = \frac{1}{2}$

   C. $\frac{1}{2} > \frac{2}{12}$

   D. $\frac{1}{2} > \frac{1}{8} + \frac{1}{8}$

6. **A.** $1 > \frac{1}{10}$

   B. $\frac{6}{9} > \frac{5}{12}$

   C. $\frac{3}{8} < \frac{3}{5}$

   D. $3 \times \frac{1}{4} > 3 \times \frac{1}{6}$

7. **A.** $\frac{4}{10}$, $\frac{4}{8}$, $\frac{4}{6}$

   B. $\frac{3}{10}$, $\frac{3}{8}$, $\frac{3}{5}$

   C. $\frac{4}{12}$, $\frac{4}{8}$, $\frac{4}{6}$

   D. When the numerators are the same, the fraction with the smaller denominator is the larger fraction.

8. **A.** $\frac{1}{3}$, $\frac{3}{8}$, $\frac{7}{12}$

   B. $\frac{5}{12}$, $\frac{1}{2}$, $\frac{3}{5}$

   C. $\frac{1}{6}$, $\frac{2}{3}$, $\frac{3}{4}$

   D. $\frac{1}{6}$, $\frac{1}{5}$, $\frac{1}{4}$

   E. $\frac{1}{12}$, $\frac{5}{12}$, $\frac{7}{12}$

   F. $\frac{2}{9}$, $\frac{1}{2}$, $\frac{3}{4}$

   G. $\frac{2}{10}$, $\frac{1}{5} + \frac{1}{5}$, $\frac{5}{10}$

   H. $\frac{1}{9}$, $\frac{3}{6}$, $\frac{1}{3} + \frac{1}{3}$

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