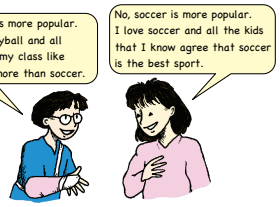
Fractions and Decimals

Good Sports

Janet and her cousin Lee Yah are in fifth grade in two different schools. They like the same kind of books and clothes. However, they disagree about one topic—sports.

After an argument about soccer and volleyball, Aunt Carol suggested that they each take a survey of their classmates' favorite sports. Later, Aunt Carol found an article which said that baseball, basketball, football, soccer, and volleyball are the 5 most popular sports in high school. The girls agreed to use these sports for their survey. The survey results are below.



Favorite Sport Lee Yah's School

Team Sport	*N* Number of Students
baseball	3
basketball	7
football	2
soccer	4
volleyball	6

Favorite Sport Janet's School

Team Sport	*N* Number of Students
baseball	12
basketball	5
football	6
soccer	7
volleyball	7

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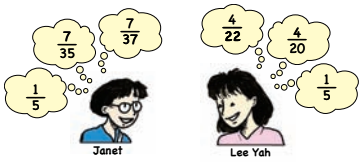
1. What is the favorite sport in each school?
2. Is baseball more popular in Lee Yah's class or in Janet's class?
3. What fraction of the students in each school chose volleyball?
4. Is volleyball more popular in Lee Yah's class or in Janet's class?
5. What fraction of the students in each school chose soccer?
6. Is soccer more popular in Lee Yah's class or Janet's class?

***Student Guide* - Page 362**

The girls compared the soccer data. They still didn't know if soccer was more popular in Lee Yah's class or more popular in Janet's class. They decided that comparing fractions with unlike denominators requires some thought.



7. Compare $\frac{4}{22}$ to $\frac{7}{37}$. Which do you think is greater?

Decimals with Circle Pieces

Use fraction circle pieces to solve and model each problem. The red circle is the unit whole.

8. Shannon and Jessie were using fraction circle pieces to model and compare fractions.

A. Who is showing the larger fraction, Jessie or Shannon? How do you know?
B. Name the fraction that Jessie is showing. Write a common and decimal fraction.
C. Name the fraction that Shannon is showing. Write a common and decimal fraction.
D. Show or tell how to use decimals to compare the fractions Jessie and Shannon are showing.

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***Student Guide* - Page 363**

Student Guide

Fractions and Decimals (SG pp. 362–367) Questions 1–23

1. Basketball is the most popular sport in Lee Yah's school with $\frac{7}{22}$ students choosing it as the favorite. Baseball is the most popular sport in Janet's school with $\frac{12}{37}$ students choosing it as the favorite.

2.* Baseball is definitely more popular in Janet's class than in Lee Yah's class. $\frac{12}{37}$ is greater than $\frac{3}{22}$.

3. $\frac{6}{22}$ students like volleyball in Lee Yah's school and $\frac{7}{37}$ students like volleyball in Janet's school

4.* Volleyball is more popular in Lee Yah's class. $\frac{6}{22}$ is about $\frac{6}{24}$ or $\frac{1}{4}$. $\frac{7}{37}$ is about $\frac{7}{35}$ or $\frac{1}{5}$. $\frac{1}{4}$ is greater than $\frac{1}{5}$.

5. $\frac{4}{22}$ students like soccer in Lee Yah's school and $\frac{7}{37}$ students like soccer in Janet's school.

6.* Possible response: I am not sure. The fractions seem really similar in size. $\frac{7}{37}$ is about $\frac{7}{35}$ or $\frac{1}{5}$ and $\frac{4}{22}$ is about $\frac{4}{20}$ or $\frac{1}{5}$.

7.* Responses will vary.

8. A.* Jessie is showing the larger fraction of the red circle. I know because more of the circle is shaded.

   B.* $\frac{9}{10}$ and 0.9 of the red circle is shaded; I see she has shaded $\frac{1}{10}$ less of a whole. $\frac{10}{10} - \frac{1}{10} = \frac{9}{10}$.

   C.* $\frac{7}{10}$ and 0.7 of the red circle; a pink is $\frac{5}{10}$ and a green is $\frac{2}{10}$. $\frac{5}{10} + \frac{2}{10} = \frac{7}{10}$.

   D.* $\frac{9}{10} > \frac{7}{10}$ or $0.9 > 0.7$

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

9. A.* I agree with Jessie's solution because $\frac{1}{4}$ of a whole is a quarter and a quarter is .25 or $\frac{25}{100}$ of a whole.

B.* .25

10. A. $\frac{4}{10} = 0.4$ **B.** $\frac{5}{10} = 0.5$

C. $\frac{5}{10} < \frac{6}{10}$ **D.** $\frac{1}{4} > \frac{2}{10}$

E. $\frac{2}{4} > .4$ **F.** $\frac{1}{4} = .25$

G. $0.8 = \frac{80}{100}$ **H.** $\frac{1}{10} = \frac{10}{100}$

I. $\frac{3}{4} = .75$

11.* I agree with Jessie because 0.55 is $\frac{5}{100}$ greater than five tenths.

12. A. $\frac{17}{20} > \frac{3}{5}$ because $\frac{17}{20} = \frac{85}{100}$ and $\frac{3}{5} = \frac{60}{100}$

B. $\frac{1}{2} < \frac{36}{60}$ because $\frac{1}{2} = \frac{5}{10}$ and $\frac{36}{60} = \frac{6}{10}$

C. $\frac{14}{25} > \frac{11}{20}$ because $\frac{14}{25} = \frac{56}{100}$ and $\frac{11}{20} = \frac{55}{100}$

D. See Question 12C for possible reasoning strategy.

E.* John wrote each fraction as a decimal. $\frac{1}{2}$ is equal to five tenths and $\frac{36}{60}$ is equal to six tenths. These can be written as 0.5 and 0.6.

13. A. ten

B. $\frac{1}{10}$

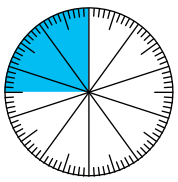
C. The purple piece is equivalent to $\frac{1}{10}$.

14. A. 100 parts

B. $\frac{1}{100}$

C. $\frac{1}{10} = \frac{10}{100}$

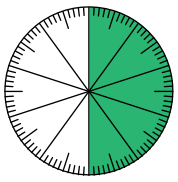
15. A.



B. $\frac{1}{4} = \frac{25}{100}$

C. 0.25

16. A.

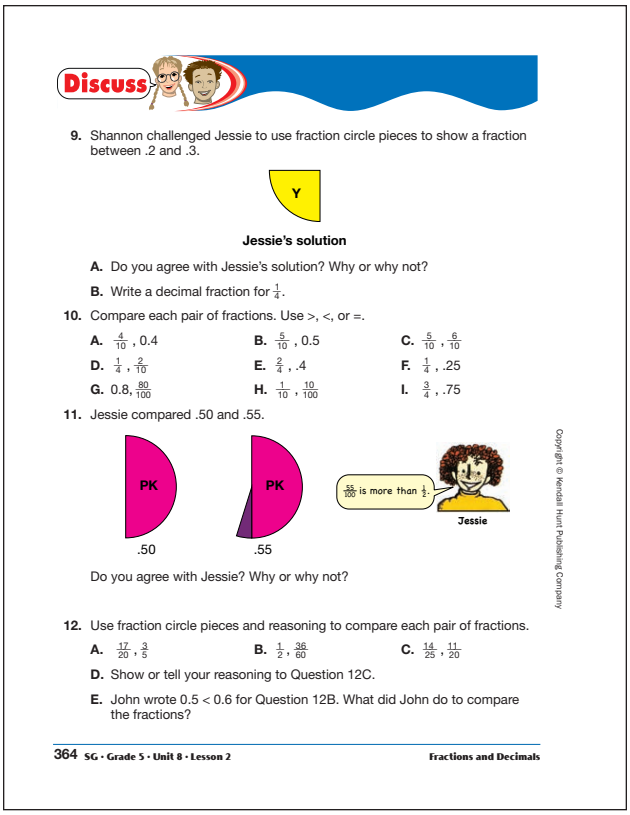


B. $\frac{1}{2} = \frac{50}{100}$

C. 0.50

17. A. $\frac{1}{10} = \frac{10}{100}$ **B.** $\frac{1}{20} = \frac{5}{100}$

C. $\frac{3}{4} = \frac{75}{100}$ **D.** $\frac{1}{5} = \frac{20}{100}$



Discuss

9. Shannon challenged Jessie to use fraction circle pieces to show a fraction between .2 and .3.

Y

Jessie's solution

A. Do you agree with Jessie's solution? Why or why not?

B. Write a decimal fraction for $\frac{1}{4}$.

10. Compare each pair of fractions. Use >, <, or =.

A. $\frac{4}{10}$, 0.4 B. $\frac{5}{10}$, 0.5 C. $\frac{5}{10}$, $\frac{6}{10}$

D. $\frac{1}{4}$, $\frac{2}{10}$ E. $\frac{2}{4}$, .4 F. $\frac{1}{4}$, .25

G. 0.8, $\frac{80}{100}$ H. $\frac{1}{10}$, $\frac{10}{100}$ I. $\frac{3}{4}$, .75

11. Jessie compared .50 and .55.

PK PK

.50 .55

$\frac{55}{100}$ is more than $\frac{1}{2}$.

Jessie

Do you agree with Jessie? Why or why not?

12. Use fraction circle pieces and reasoning to compare each pair of fractions.

A. $\frac{17}{20}$, $\frac{3}{5}$ B. $\frac{1}{2}$, $\frac{36}{60}$ C. $\frac{14}{25}$, $\frac{11}{20}$

D. Show or tell your reasoning to Question 12C.

E. John wrote 0.5 < 0.6 for Question 12B. What did John do to compare the fractions?

364 SG • Grade 5 • Unit 8 • Lesson 2 Fractions and Decimals

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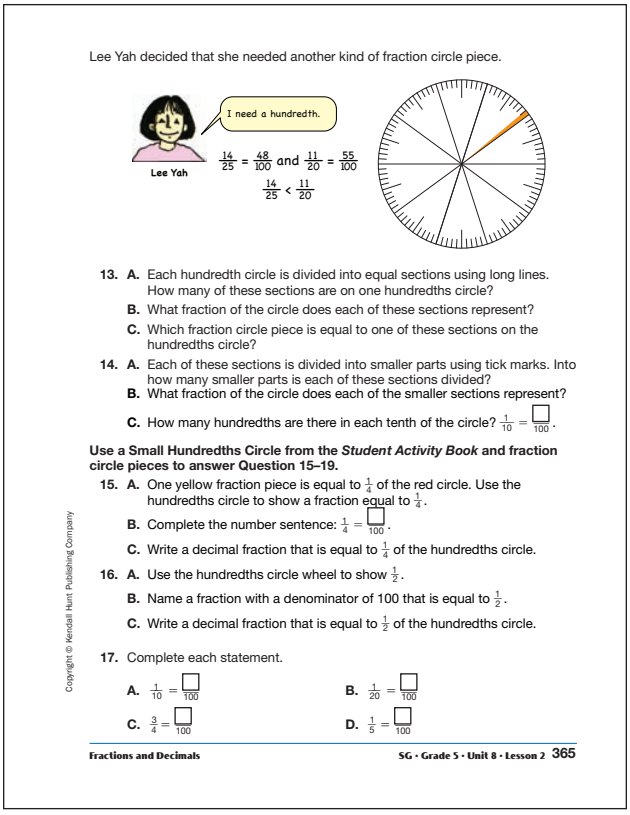
***Student Guide* - Page 364**



Lee Yah decided that she needed another kind of fraction circle piece.

Lee Yah: I need a hundredth.

$\frac{14}{25} = \frac{48}{100}$ and $\frac{11}{20} = \frac{55}{100}$

$\frac{14}{25} < \frac{11}{20}$

13. A. Each hundredth circle is divided into equal sections using long lines. How many of these sections are on one hundredths circle?

B. What fraction of the circle does each of these sections represent?

C. Which fraction circle piece is equal to one of these sections on the hundredths circle?

14. A. Each of these sections is divided into smaller parts using tick marks. Into how many smaller parts is each of these sections divided?

B. What fraction of the circle does each of the smaller sections represent?

C. How many hundredths are there in each tenth of the circle? $\frac{1}{10} = \frac{\square}{100}$.

Use a Small Hundredths Circle from the *Student Activity Book* and fraction circle pieces to answer Question 15–19.

15. A. One yellow fraction piece is equal to $\frac{1}{4}$ of the red circle. Use the hundredths circle to show a fraction equal to $\frac{1}{4}$.

B. Complete the number sentence: $\frac{1}{4} = \frac{\square}{100}$.

C. Write a decimal fraction that is equal to $\frac{1}{4}$ of the hundredths circle.

16. A. Use the hundredths circle wheel to show $\frac{1}{2}$.

B. Name a fraction with a denominator of 100 that is equal to $\frac{1}{2}$.

C. Write a decimal fraction that is equal to $\frac{1}{2}$ of the hundredths circle.

17. Complete each statement.

A. $\frac{1}{10} = \frac{\square}{100}$ B. $\frac{1}{20} = \frac{\square}{100}$

C. $\frac{3}{4} = \frac{\square}{100}$ D. $\frac{1}{5} = \frac{\square}{100}$

Fractions and Decimals SG • Grade 5 • Unit 8 • Lesson 2 365

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***Student Guide* - Page 365**

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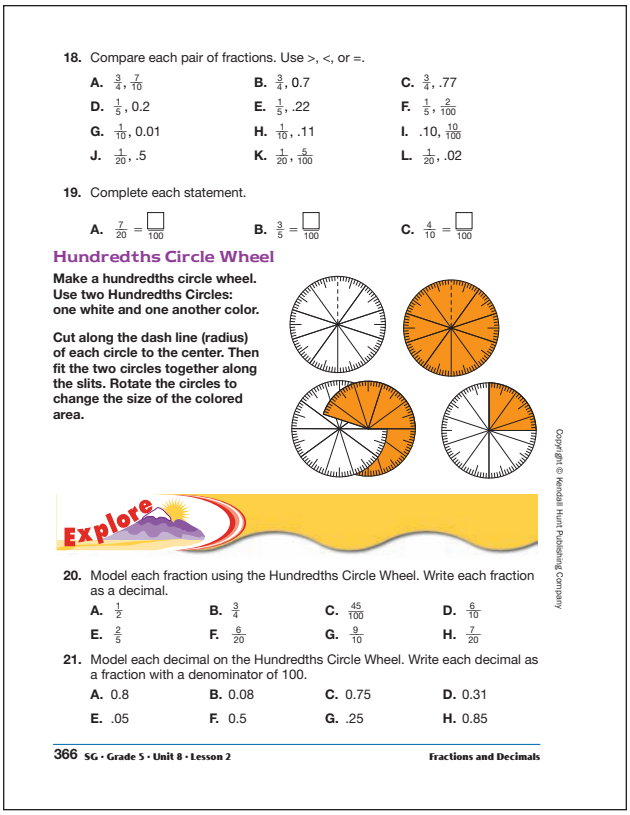

18. Compare each pair of fractions. Use >, <, or =.

A. $\frac{3}{4}$, $\frac{7}{10}$ B. $\frac{3}{4}$, 0.7 C. $\frac{3}{4}$, .77
D. $\frac{1}{5}$, 0.2 E. $\frac{1}{5}$, .22 F. $\frac{1}{5}$, $\frac{2}{100}$
G. $\frac{1}{10}$, 0.01 H. $\frac{1}{10}$, .11 I. .10, $\frac{10}{100}$
J. $\frac{1}{20}$, .5 K. $\frac{1}{20}$, $\frac{5}{100}$ L. $\frac{1}{20}$, .02

19. Complete each statement.

A. $\frac{7}{20} = \frac{\square}{100}$ B. $\frac{3}{5} = \frac{\square}{100}$ C. $\frac{4}{10} = \frac{\square}{100}$

Hundredths Circle Wheel

Make a hundredths circle wheel. Use two Hundredths Circles: one white and one another color.

Cut along the dash line (radius) of each circle to the center. Then fit the two circles together along the slits. Rotate the circles to change the size of the colored area.

Explore

20. Model each fraction using the Hundredths Circle Wheel. Write each fraction as a decimal.

A. $\frac{1}{2}$ B. $\frac{3}{4}$ C. $\frac{45}{100}$ D. $\frac{6}{10}$
E. $\frac{2}{5}$ F. $\frac{6}{20}$ G. $\frac{9}{10}$ H. $\frac{7}{20}$

21. Model each decimal on the Hundredths Circle Wheel. Write each decimal as a fraction with a denominator of 100.

A. 0.8 B. 0.08 C. 0.75 D. 0.31
E. .05 F. 0.5 G. .25 H. 0.85

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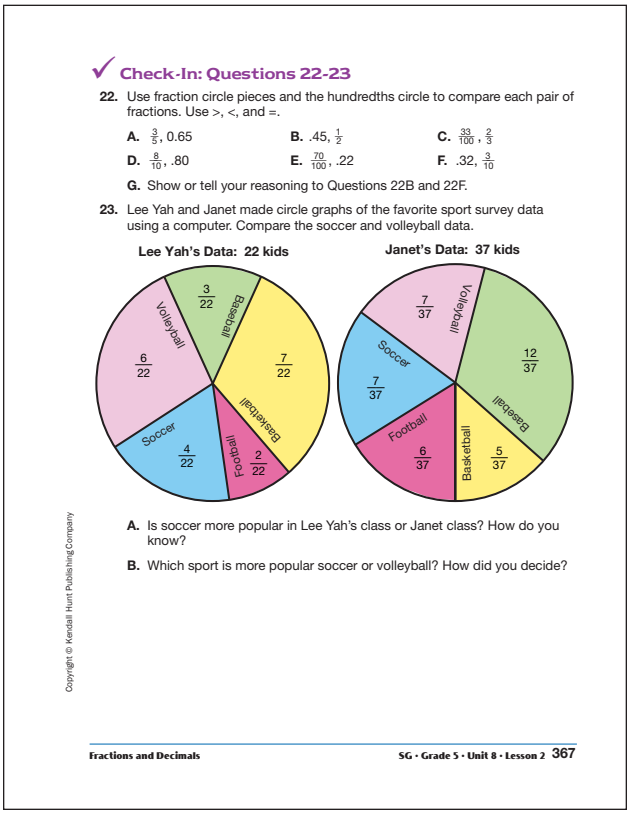
***Student Guide* - Page 366**



Check-In: Questions 22-23

22. Use fraction circle pieces and the hundredths circle to compare each pair of fractions. Use >, <, and =.

A. $\frac{3}{5}$, 0.65 B. .45, $\frac{1}{2}$ C. $\frac{33}{100}$, $\frac{2}{3}$
D. $\frac{8}{10}$, .80 E. $\frac{70}{100}$, .22 F. .32, $\frac{3}{10}$

G. Show or tell your reasoning to Questions 22B and 22F.

23. Lee Yah and Janet made circle graphs of the favorite sport survey data using a computer. Compare the soccer and volleyball data.

A. Is soccer more popular in Lee Yah's class or Janet class? How do you know?

B. Which sport is more popular soccer or volleyball? How did you decide?

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***Student Guide* - Page 367**

18. A. $\frac{3}{4} > \frac{7}{10}$ B. $\frac{3}{4} > 0.7$
C. $\frac{3}{4} < 0.77$ D. $\frac{1}{5} = 0.2$
E. $\frac{1}{5} < .22$ F. $\frac{1}{5} > \frac{2}{100}$
G. $\frac{1}{10} > 0.01$ H. $\frac{1}{10} < .11$
I. $.10 = \frac{10}{100}$ J. $\frac{1}{20} < .5$
K. $\frac{1}{20} = \frac{5}{100}$ L. $\frac{1}{20} > .02$

19. A. $\frac{7}{20} = \frac{35}{100}$ B. $\frac{3}{5} = \frac{60}{100}$
C. $\frac{4}{10} = \frac{40}{100}$

20. A. 0.50 B. 0.75
C. 0.45 D. 0.6
E. 0.4 F. 0.3
G. 0.9 H. 0.35

21 A. $\frac{80}{100}$ B. $\frac{8}{100}$
C. $\frac{75}{100}$ D. $\frac{31}{100}$
E. $\frac{5}{100}$ F. $\frac{50}{100}$
G. $\frac{25}{100}$ H. $\frac{85}{100}$

22. A. $\frac{3}{5} < 0.65$ B. $.45 < \frac{1}{2}$
C. $\frac{33}{100} < \frac{2}{3}$ D. $\frac{8}{10} = .80$
E. $\frac{70}{100} > .22$ F. $.32 > \frac{3}{10}$

G. Possible responses: $\frac{1}{2} = .50$ and $.45 < .50$ because 4 tenths is less than 5 tenths; $\frac{3}{10} = 0.3$ and .32 is greater than .30.

23. A.* Soccer is more popular in Janet's class. I used the hundredths circle and $\frac{7}{37} = \frac{19}{100}$ and $\frac{4}{22}$ is about $\frac{18}{100}$.

B. Responses will vary. I think volleyball is more popular than soccer because $\frac{13}{59}$ fifth graders like volleyball and only $\frac{11}{59}$ of the fifth graders like soccer.

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