

Student Guide

Questions 1–25 (SG pp. 466–471)

1. A.\* A denominator of 100 means the whole is divided into 100 equal parts. In this case, one dollar is divided into 100 cents.
  - B.\* A numerator of 1 means we are interested in 1 of the equal parts.
  - C.\* The 0 to the left of the decimal point in 0.01 means there are no wholes and the 0 to the right of the decimal point means there are no tenths.
2. A. fourteen-hundredths of a dollar
  - B.  $\frac{14}{100}$  and 0.14 (Writing .14 is acceptable.)
3. A.\* fifteen-hundredths of a meter;  $0.15$ ,  $\frac{15}{100}$ 
  - B.\* More than one-tenth of a meter
4. A.  $\frac{20}{100}$  of a meter
  - B.  $\frac{10}{100}$  m,  $\frac{20}{100}$  m
5. A.  $\frac{30}{100}$  of a meter;  $\frac{10}{100}$ ,  $\frac{20}{100}$  and  $\frac{30}{100}$  of a meter
- 6.\* A bit is used to show one-hundredth because 100 bits make a flat.
  - 7. A. 10 hundredths;  $\frac{10}{100}$  and 0.10
    - B. 40 hundredths;  $\frac{40}{100}$  and 0.40
    - C. 100 hundredths;  $\frac{100}{100}$  and 1.00 (or 1)

### Hundredths

**Exploring Hundredths**

**Discuss**

Jackie is counting the pennies in her piggy bank to see how many dollars she has. She puts the pennies into piles of 100 since she knows that 100 pennies equals 1 dollar. Jackie knows that 1 penny is one-hundredth of a dollar. You can write the fraction for one-hundredth as a common fraction or as a decimal fraction:

$\frac{1}{100}$   
common fraction

$0.01$   
decimal fraction

1. A. What does the denominator mean in the fraction  $\frac{1}{100}$ ?
- B. What does the numerator mean in the fraction  $\frac{1}{100}$ ?
- C. What do the zeros mean in the decimal fraction 0.01?

In the decimal fraction, the digits mean:

After Jackie finished putting her pennies into piles of 100, she found that she had 28 pennies (28¢) left over. These 28 pennies are a fraction of a dollar. We can write it as a common fraction ( $\frac{28}{100}$ ) or a decimal fraction (0.28). We say, "twenty-eight hundredths."

2. A. Jackie found 14 pennies in the bottom of her desk drawer. What fraction of a dollar does this represent?
- B. Write this fraction as both a decimal fraction and as a common fraction.

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Frank knows that there are 100 centimeters in a meter. That means that the length of one centimeter is 0.01 or  $\frac{1}{100}$  of a meter. Frank's pencil is 15 cm long.

3. A. What fraction of a meter is the length of Frank's pencil? Write this fraction as both a decimal fraction and as a common fraction.
- B. Is the pencil more or less than one-tenth of a meter?

4. Ming's pencil is 2 skinnies long. He knows 2 skinnies is  $\frac{2}{10}$  of a meter.

- A. How long is the pencil in hundredths of a meter?
- B. Ming showed how he counted tenths of a meter. Count the length of the pencil using hundredths of a meter.

5. How many hundredths of a meter is Shannon's super-long pencil? Tell how you counted the length of the pencil using hundredths of a meter.

**Showing Hundredths with Base-Ten Pieces**

Irma uses base-ten pieces to show hundredths. She learned in Lesson 2 that if a flat is one whole, then a skinny is one-tenth (0.1) of a whole and a pack is ten (10) wholes.

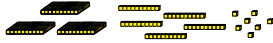
6. Which base-ten piece should Irma use to show one-hundredth? Explain why you chose the piece you did.
7. A. How many hundredths does a skinny represent? Write this number as a common fraction and as a decimal fraction.
- B. How many hundredths do 4 skinnies represent? Write the number as a common fraction and as a decimal fraction.
- C. How many hundredths does a flat represent? Write this number as a common fraction and as a decimal fraction.

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

Nicholas used the following base-ten pieces to show a number. If a flat is one whole, what number do these pieces represent?



These pieces show 3 wholes, 5 tenths, and 7 hundredths. We can write 3.57 or  $3\frac{57}{100}$  for this number. We read both 3.57 and  $3\frac{57}{100}$  as "three and fifty-seven hundredths."

We can record 3.57 in a place value chart.

Number	Place Value				Number Sentence	
	Tens	Ones	Tenths	Hundredths	Decimal Fraction	Common Fraction
3.57	0	3	.5	7	$3 + .5 + .07 = 3.57$	$3 + \frac{5}{10} + \frac{7}{100} = 3\frac{57}{100}$

The 5 to the right of the decimal point is in the tenths place and the 7 is in the hundredths place. So 3.57 is made up of 3 ones (3), 5 tenths ( $\frac{5}{10}$ ) and 7 hundredths ( $\frac{7}{100}$ ).

8. A. Place these base-ten pieces on your desk. If a flat is one whole, what number do these pieces represent?



- B. Write this number as a common fraction and as a decimal fraction.  
 C. What digit is in the tenths place?  
 D. What digit is in the hundredths place?
9. A. Place the following base-ten pieces on your desk. If a flat is one whole, what number do these pieces represent?

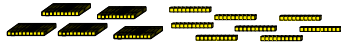


- B. Write this number as a common fraction and as a decimal fraction.  
 C. What digit is in the tenths place?  
 D. What digit is in the hundredths place?

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10. Mrs. Dewey's class recorded the number for these pieces.



Romesh recorded 5.80. Jessie recorded 5.8. Frank recorded  $5\frac{80}{100}$ . Grace recorded  $5\frac{8}{10}$ . Which student is correct? Use base-ten pieces to explain your answer.

11. Get a handful of mixed skinnies and bits and count them by hundredths. Count the skinnies first (ten-hundredths, twenty-hundredths, thirty-hundredths, etc.) and then count on for the bits. When you finish, write the decimal number and the common fraction for your handful.

Base-Ten Shorthand

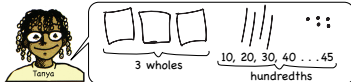
Tanya used the following base-ten pieces to show the number 3.45.



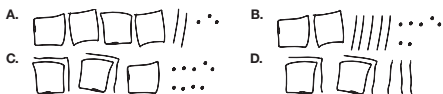
She showed her pieces using base-ten shorthand.



Tanya explained how she counted the base-ten pieces.



12. Use base-ten pieces to make these numbers. Then use base-ten shorthand to show the pieces. A flat is one whole.  
 A. 2.34 B. 0.08 C. 0.30 D. 13.42 E. 3.04  
 F. Show how you counted the base-ten pieces for Question 12A.
13. Write a decimal and a common fraction for the base-ten shorthand below:



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8. A. 5.62; 5 wholes, 6 tenths, and 2 hundredths

B.  $5\frac{62}{100}$  and 5.62

C. 6

D. 2

9. A.\* two and three-hundredths

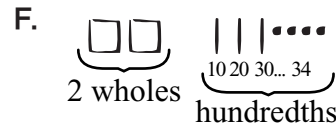
B.\*  $2\frac{3}{100}$  and 2.03

C.\* 0

D.\* 3

- 10.\* All are correct. 5.80 means five wholes, eight tenths, and no hundredths. 5.8 means five wholes and eight tenths; no hundredths is implied.  $5\frac{80}{100}$  and  $5\frac{8}{10}$  are the common fractions for these numbers. Using base-ten pieces, all four students show the same pieces. The difference is how they are counted. Romesh is counting the bits or hundredths. Jessie is counting skinnies or tenths.

11. Answers will vary.



13. A. 4.23 and  $4\frac{23}{100}$  B. 2.57 and  $2\frac{57}{100}$

- C. 21.09 and  $21\frac{9}{100}$  D. 20.3 and  $20\frac{3}{10}$

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

14. A. | and ||

B. Answers will vary. Possible response:

|••••• 0.15 and  $\frac{15}{100}$

15. A. □ □ |||||

and

□ □ |||||

B. Answers will vary. Possible response:

□ □ ||||| •••

2.53 and  $2\frac{53}{100}$

16. A.\* 0.28

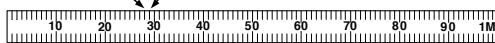
B.\* 0.01

C.\*  $\frac{1}{100}$

D.\* 0.29

E.\*  $0.28 + 0.01 = 0.29$

17. A. 0.28 → 0.29

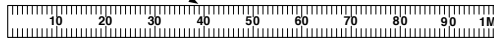


18. A.\* 0.10 or 0.1

B.\*  $\frac{10}{100}$  or  $\frac{1}{10}$

C.\*  $0.29 + 0.10 = 0.39$

D.\* 0.39



19. A.\*  $0.10 + 0.01 = 0.11$

The zeros to the left of the decimal mean no ones. The first place to the right of the decimal shows how many tenths. The second place to the right shows how many hundredths.

B.\*  $\frac{1}{10} + \frac{1}{100} = \frac{11}{100}$

20. A. 0.45

B. 0.36

C. 0.15

D. 0.06

- 14. A. Use base-ten pieces to make 0.1 and 0.2.
- B. Use base-ten pieces to make a number more than 0.1 but less than 0.2. Use base-ten shorthand to show the pieces you used. Then write your number as both a decimal number and a common fraction.
- 15. A. Use base-ten pieces to make 2.5 and 2.6.
- B. Use base-ten pieces to make a number more than 2.5 but less than 2.6. Use base-ten shorthand to show the pieces you used. Then write your number.

**Adding a Bit (0.01) and a Skinny (0.1)**

Use a meterstick, skinnies, and bits for Questions 16–25. A flat and a meterstick each show one whole.

16. Luis grabbed 2 skinnies and 8 bits in his handful for Question 11.



- A. What number did Luis grab? Write your answer as a decimal.
- B. Luis added one more bit to his handful. Write the number for one bit, the number he added, as a decimal.
- C. Write the number he added as a fraction.
- D. Write Luis's sum as a decimal.
- E. Write a number sentence for Luis's sum.

17. Locate your answers to Questions 16A and 16D on a meterstick. A meterstick is one whole.

18. Luis started with 0.29 and added one skinny to his handful.

- A. What number did he add? Write your answer as a decimal.
- B. Write the number he added as a fraction.
- C. Write Luis's sum as a number sentence with decimals.
- D. Locate Luis's sum in Question 18C on a meterstick.

19. A. Write a number sentence for adding one skinny and one bit using decimals. What does each number in the sentence mean?

B. Write a number sentence for adding one skinny and one bit using common fractions.

20. Use a meterstick or skinnies and bits to find the following:

- A. 0.1 more than 0.35
- B. 0.01 more than 0.35
- C. 0.1 more than 0.05
- D. 0.01 more than 0.05

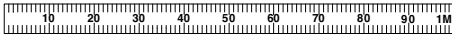
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**Comparing Decimals Using Hundredths**

21. Jerome used a meterstick, skinnies, and bits to measure distances to the nearest hundredth of a meter. Write Jerome's measurements as decimal fractions.

- A. 5 skinnies and 5 bits
- B. 3 skinnies and 8 bits
- C. 1 meterstick and 5 bits
- D. 1 skinny and 5 bits
- E. 15 bits
- F. 40 skinnies
- G. 5 bits
- H. 2 skinnies and 20 bits

22. Look at your meterstick.

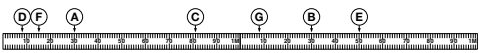


- A. Where is one-half ( $\frac{1}{2}$ ) meter? Write the distance as a decimal.
- B. Where is one-fourth ( $\frac{1}{4}$ ) meter? Write the distance as a decimal.
- C. Where is three-fourths ( $\frac{3}{4}$ ) meter? Write the distance as a decimal.

23. Use your work for Question 21 to make the number sentences true. Use  $<$ ,  $>$ , or  $=$ .

- A.  $0.25 \bigcirc \frac{1}{4}$
- B.  $0.25 \bigcirc 0.1$
- C.  $0.4 \bigcirc 0.25$
- D.  $0.5 \bigcirc \frac{1}{2}$
- E.  $0.5 \bigcirc 0.12$
- F.  $0.50 \bigcirc 0.6$
- G.  $0.75 \bigcirc \frac{3}{4}$
- H.  $0.75 \bigcirc 0.9$
- I.  $0.5 \bigcirc 0.75$

24. Ana used metersticks to measure the distances shown on the metersticks below. Write each distance to the nearest hundredth of a meter.



25. Use your work for Question 24 to make the number sentences true.

- A.  $1.50 \bigcirc 0.82$
- B.  $0.08 \bigcirc 0.82$
- C.  $0.16 \bigcirc 1.30$
- D.  $1.08 \bigcirc 1.50$

The *Using a Hundredths Chart* pages in the *Student Activity Guide* provide practice with skip counting by hundredths.

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**Homework**

Complete these questions after playing *Hundredths, Hundredths, Hundredths*.

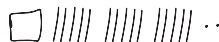
1. Lee Yah and Jerome were playing *Hundredths, Hundredths, Hundredths*. Jerome tried to trick Lee Yah by making this number:

.....

For her fractions Lee Yah wrote  $\frac{23}{100}$  and 0.023 and said, "Twenty-three hundredths." Lee Yah said she should earn 3 points.

Jerome thought that Lee Yah was wrong, but he couldn't explain why. What do you think?

2. Write the common fraction and decimal for the next number Jerome made.



3. Write the common fraction and decimal for Lee Yah's next number.



4. Jessie and Roberto were playing. Roberto made this number. Write the common fraction and decimal fraction for Roberto's number.



5. Jessie made 6.48. Use base-ten shorthand to show this number.

6. Roberto wanted to build the number 9.06. Use base-ten shorthand to show what pieces he should use.

7. Jessie wrote nine and six-hundredths as 9.6. Explain why this is incorrect.

**Measuring a Hundredth of a Meter**

8. Jerome measured several distances. They are labeled on the metersticks below. Write each distance to the nearest hundredth of a meter.



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- 21. A. 0.55 meter      B. 0.38 meter
- C. 1.05 meters      D. 0.15 meter
- E. 0.15 meter      F. 0.40 meter
- G. 0.05 meter      H. 0.40 meter
- 22. A. 0.50 meter
- B. 0.25 meter
- C. 0.75 meters
- 23. A. =      B. >      C. >
- D. =      E. >      F. <
- G. =      H. <      I. <
- 24. A. 0.30 meter      B. 1.30 meters
- C. 0.81 meter      D. 0.08 meter
- E. 1.50 meters      F. 0.15 meter
- 25. A. >
- B. <
- C. <
- D. <

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**Homework (SG p. 473)**

**Questions 1–8**

1. Possible responses: The common fraction  $\frac{23}{100}$  is correct, but the decimal fraction 0.023 is not correct. Lee Yah is wrong because the 0 in the tenths place in 0.023 means that there are no tenths. Since the twenty bits can be traded for two skinnies with 3 bits (3 hundredths) left over, the number should be written 0.23.
2.  $2\frac{52}{100}$  and 2.52
3.  $2\frac{91}{100}$  and 2.91
4.  $\frac{54}{100}$  and 0.54
- 5.
- 6.
7. 9.6 means 9 wholes and 6 tenths, not 9 wholes and 6 hundredths. Nine and six-hundredths is written: 9.06
8. A. 0.40 of a meter
- B. 1.04 meters
- C. 0.48 of a meter
- D. 1.10 meters
- E. 1.83 meters

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Student Activity Book

Using a Hundredths Chart (SAB pp. 421–423)

Questions 1–8

1. A. 0.1  
 B. 0.1 means one-tenth or 1 skinny. Since 1 skinny is equal to 10 bits, one-tenth is equal to ten-hundredths ( $0.1 = 0.10$ ). Note that in the decimal 0.10, the one means there is one-tenth and the second zero means there are no hundredths.  
 C. 0.21  
 D. 0.19  
 E. 1.00 or 1.
- 2.\* See the Sample Dialog in the lesson.
3. A. 0.76  
 B. 0.74  
 C. 0.85  
 D. 0.65
4. A. 0.51                      B. 0.49  
 C. 0.6                         D. 0.4
5. A. 0.26                      B. 0.24  
 C. 0.35                         D. 0.15
6. A. 0.06                      B. 0.04  
 C. 0.15
7. A. 0.30                      B. 0.28  
 C. 0.39                         D. 0.19
8. A. 0.71                      B. 0.69  
 C. 0.8                         D. 0.6

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Name \_\_\_\_\_ Date \_\_\_\_\_

### Using a Hundredths Chart

Professor Peabody made a Hundredths Chart. He forgot to fill in some of the chart. Help Professor Peabody by filling in the missing values.

0.01	0.02			0.06			0.1
	0.12		0.15		0.18		
0.21		0.24		0.27			
0.31	0.33		0.36				0.4
			0.45		0.48		
	0.52						
0.61			0.65			0.69	0.7
		0.73		0.76		0.79	
0.81					0.88		0.9
0.91		0.93			0.97		1

Use your completed chart to answer Questions 1–4.

1. A. What number on the chart comes just after 0.09? \_\_\_\_\_  
 B. Why is it recorded as 0.1? What do the digits mean?  
  
 C. What number comes just after 0.2 on the chart? \_\_\_\_\_  
 D. What number comes just before 0.2? \_\_\_\_\_  
 E. What number comes after 0.99? \_\_\_\_\_
2. Describe any patterns that you see in the Hundredths Chart you completed. Write your answers on the back of this page.

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Name \_\_\_\_\_ Date \_\_\_\_\_

3. A. Find 0.01 more than 0.75. Where is it on the chart?  
 B. Find 0.01 less than 0.75. Where is it on the chart?  
 C. Find 0.1 more than 0.75. Where is it on the chart?  
 D. Find 0.1 less than 0.75. Where is it on the chart?
4. A. 0.01 more than 0.5 is \_\_\_\_\_    B. 0.01 less than 0.5 is \_\_\_\_\_  
 C. 0.1 more than 0.5 is \_\_\_\_\_    D. 0.1 less than 0.5 is \_\_\_\_\_

Use the Hundredths Chart or skinnies and bits to complete Questions 5–8.

5. A.  $0.25 + 0.01 =$  \_\_\_\_\_    B.  $0.25 - 0.01 =$  \_\_\_\_\_  
 C.  $0.25 + 0.1 =$  \_\_\_\_\_    D.  $0.25 - 0.1 =$  \_\_\_\_\_
6. A.  $0.05 + 0.01 =$  \_\_\_\_\_    B.  $0.05 - 0.01 =$  \_\_\_\_\_  
 C.  $0.05 + 0.1 =$  \_\_\_\_\_
7. A.  $0.29 + 0.01 =$  \_\_\_\_\_    B.  $0.29 - 0.01 =$  \_\_\_\_\_  
 C.  $0.29 + 0.1 =$  \_\_\_\_\_    D.  $0.29 - 0.1 =$  \_\_\_\_\_
8. A.  $0.7 + 0.01 =$  \_\_\_\_\_    B.  $0.7 - 0.01 =$  \_\_\_\_\_  
 C.  $0.7 + 0.1 =$  \_\_\_\_\_    D.  $0.7 - 0.1 =$  \_\_\_\_\_

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

Name \_\_\_\_\_ Date \_\_\_\_\_

### Many Ways to Show Hundredths

1. Complete the place value chart. Use decimals in the number sentences.

Number	Place Value				Number Sentence
	Tens	Ones	Tenths	Hundredths	
A. 24.37			.		$20 + 4 + .3 + .07 = 24.37$
B. 13.09			.		
C. 4.65		4	.	6 5	
D. 2.24			.		
E. 7.70		7	.	7 0	

2. Complete the place value chart. Use fractions in the number sentences.

Number	Place Value				Number Sentence
	Tens	Ones	Tenths	Hundredths	
A. 11.28			.		$10 + 1 + \frac{2}{10} + \frac{8}{100} = 11\frac{28}{100}$
B. 27.08			.		
C. 60.33			.		
D. 17.5			.		
E. 6.84			.		

3. Label the following numbers on the number line below. The first one is an example.

Ex. 0.52      A. 0.2      B. 0.95      C.  $\frac{27}{100}$   
 D. 0.80      E. 4 skinnies, 3 bits      F. 72 bits

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Name \_\_\_\_\_ Date \_\_\_\_\_

### Linda's Base-Ten Pieces

Use base-ten pieces (packs, flats, skinnies, and bits) to answer the questions below. A flat is one whole. Use decimals in your answers.

- If a flat is 1, what number is a pack? \_\_\_\_\_
- If a flat is 1, what number is a skinny? \_\_\_\_\_
- If a flat is 1, what number is a bit? \_\_\_\_\_

Linda has two base-ten pieces. She might have bits, skinnies, flats, or packs. For example, she might have two flats. She might have something else.

- Find all the possible sets of pieces that Linda might have. Use base-ten shorthand to show each set she might have. Write the number for each set.
- What is the largest number that Linda could possibly have? Show or tell how you know.
- What is the smallest number that Linda could possibly have? Show or tell how you know.
- Put the numbers that Linda could have in order from smallest to largest.

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Many Ways to Show Hundredths (SAB p. 424)

Questions 1–3

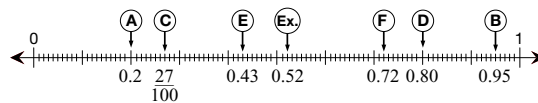
1.

Number	Place Value				Number Sentence
	Tens	Ones	Tenths	Hundredths	
A. 24.37	2	4	.	3 7	$20 + 4 + 0.3 + 0.07 = 24.37$
B. 13.09	1	3	.	0 9	$10 + 3 + 0.09 = 13.09$
C. 4.65	0	4	.	6 5	$4 + 0.6 + 0.05 = 4.65$
D. 2.24	0	2	.	2 4	$2 + 0.2 + 0.04 = 2.24$
E. 7.7	0	7	.	7 0	$7 + 0.7 = 7.7$

2.

Number	Place Value				Number Sentence
	Tens	Ones	Tenths	Hundredths	
A. 11.28	1	1	.	2 8	$10 + 1 + \frac{2}{10} + \frac{8}{100} = 11\frac{28}{100}$
B. 27.08	2	7	.	0 8	$20 + 7 + \frac{8}{100} = 27\frac{8}{100}$
C. 60.33	6	0	.	3 3	$60 + \frac{3}{10} + \frac{3}{100} = 60\frac{33}{100}$
D. 17.5	1	7	.	5 0	$10 + 7 + \frac{5}{10} = 17\frac{5}{10}$ or $17\frac{1}{2}$
E. 6.84	0	6	.	8 4	$6 + \frac{8}{10} + \frac{4}{100} = 6\frac{84}{100}$

3.



Linda's Base-Ten Pieces (SAB p. 427)

Questions 1–7

- 10.0 or 10      2. 0.1      3. 0.01
- |     |       |     |      |
|-----|-------|-----|------|
| □ □ | 20    | □   | 1.1  |
| □   | 11    | □ • | 1.01 |
| □   | 10.1  |     | 0.2  |
| □ • | 10.01 | •   | 0.11 |
| □ □ | 2     | • • | 0.02 |
- 20; Possible response: The packs are the biggest and show 10 each.
- 0.02; Possible response: There are only 2 bits and they are the smallest pieces.
- 0.02, 0.11, 0.2, 1.01, 1.1, 2, 10.01, 10.1, 11, 20

