Chapter 9

Relate Fractions and Decimals

Show What You Know

Check your understanding of important skills.

Name _____

Count Coins Find the total value.

1. 

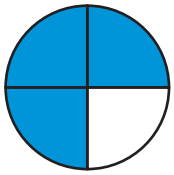
Total value: _____

2. 

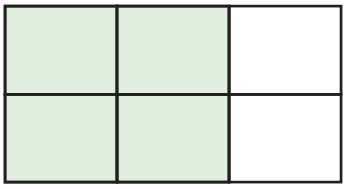
Total value: _____

Equivalent Fractions

Write two equivalent fractions for the picture.

3. 

_____

4. 

_____

Fractions with Denominators of 10

Write a fraction for the words. You may draw a picture.

5. three tenths _____

6. six tenths _____

7. eight tenths _____

8. nine tenths _____

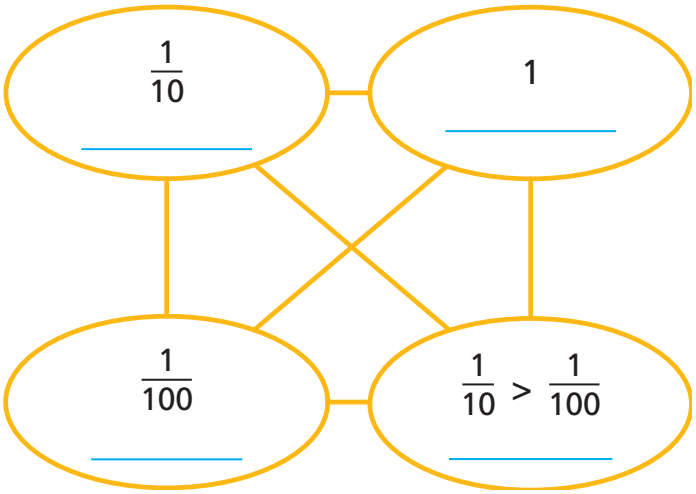
The Hudson River Science Barge, docked near New York City, provides a demonstration of how renewable energy can be used to produce food for large cities. Vegetables grown on the barge require _____ of the water needed by field crops. Be a Math Detective. Use these clues to find the fraction and decimal for the missing amount.

- The number is less than one and has two decimal places.
- The digit in the hundredths place has a value of $\frac{5}{100}$.
- The digit in the tenths place has a value of $\frac{2}{10}$.

Vocabulary Builder

Visualize It

Complete the Semantic Map by using words with a ✓.



Review Words

- ✓ compare
- equivalent fractions
- fraction
- place value
- ✓ whole

Preview Words

- decimal
- decimal point
- equivalent decimals
- ✓ hundredth
- ✓ tenth

Understand Vocabulary

Draw a line to match each word with its definition.

Word	Definition
1. decimal	• Two or more decimals that name the same amount
2. decimal point	• One part out of one hundred equal parts
3. tenth	• A number with one or more digits to the right of the decimal point
4. hundredth	• One part out of ten equal parts
5. equivalent decimals	• A symbol used to separate dollars from cents in money amounts and to separate the ones and the tenths places in decimals

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Name _____

Relate Tenths and Decimals

Essential Question How can you record tenths as fractions and decimals?

UNLOCK the Problem REAL WORLD

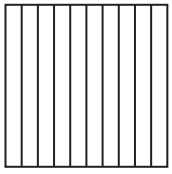
Ty is reading a book about metamorphic rocks. He has read $\frac{7}{10}$ of the book. What decimal describes the part of the book Ty has read?

A **decimal** is a number with one or more digits to the right of the **decimal point**. You can write tenths and hundredths as fractions or decimals.

One Way Use a model and a place-value chart.

Fraction

Shade $\frac{7}{10}$ of the model.



Think: The model is divided into 10 equal parts. Each part represents one **tenth**.

Write: _____

Read: seven tenths

Decimal

$\frac{7}{10}$ is 7 tenths.

Ones	.	Tenths	Hundredths
	.		

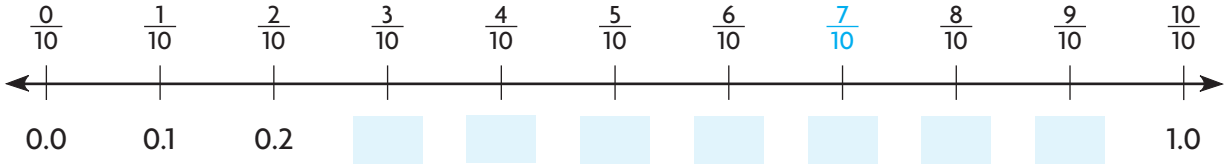
↑ decimal point

Write: _____

Read: _____

Another Way Use a number line.

Label the number line with decimals that are equivalent to the fractions. Locate the point $\frac{7}{10}$.



_____ names the same amount as $\frac{7}{10}$.

So, Ty read 0.7 of the book.

MATHEMATICAL PRACTICES

Math Talk **Explain** how the size of one whole is related to the size of one tenth.

- How can you write 0.1 as a fraction? **Explain**.

_____

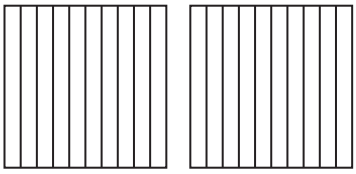
Tara rode her bicycle $1\frac{6}{10}$ miles. What decimal describes how far she rode her bicycle?

You have already written a fraction as a decimal. You can also write a mixed number as a decimal.

One Way Use a model and a place-value chart.

Fraction

Shade $1\frac{6}{10}$ of the model.



Write: _____

Read: one and six tenths

Decimal

$1\frac{6}{10}$ is 1 whole and 6 tenths.

Think: Use the ones place to record wholes.

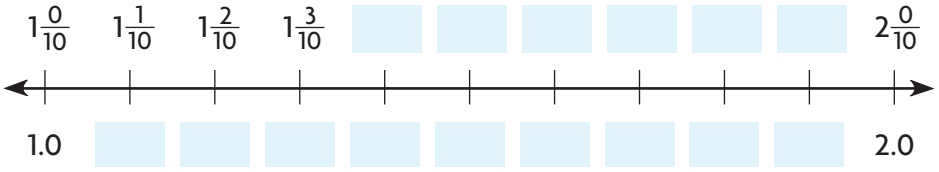
Ones	.	Tenths	Hundredths
	.		

Write: _____

Read: _____

Another Way Use a number line.

Label the number line with equivalent mixed numbers and decimals. Locate the point $1\frac{6}{10}$.

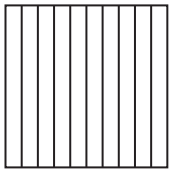


_____ names the same amount as $1\frac{6}{10}$.

So, Tara rode her bicycle _____ miles.

Try This! Write 1 as a fraction and as a decimal.

Shade the model to show 1.



Fraction: _____

Think: 1 is 1 whole and 0 tenths.

Ones	.	Tenths	Hundredths
	.		

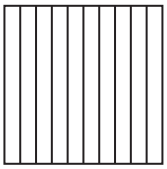
Decimal: _____

Name _____

Share and Show

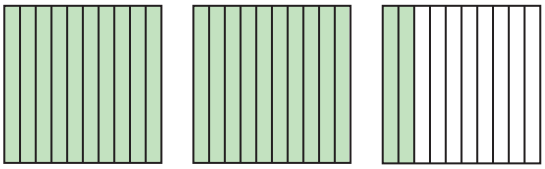
1. Write five tenths as a fraction and as a decimal.

Fraction: _____ Decimal: _____

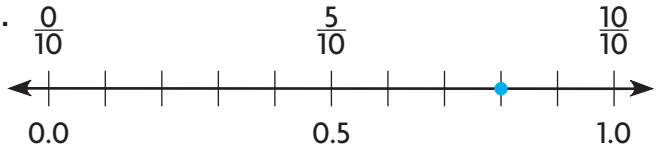


Ones	.	Tenths	Hundredths
	.		

Write the fraction or mixed number and the decimal shown by the model.

2. 

_____ _____

3. 

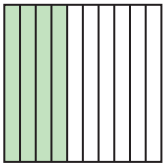
_____ _____

Math Talk MATHEMATICAL PRACTICES

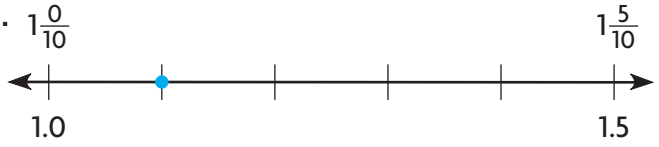
How can you write $1\frac{3}{10}$ as a decimal? **Explain.**

On Your Own

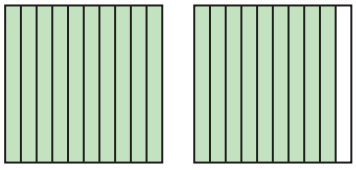
Write the fraction or mixed number and the decimal shown by the model.

4. 

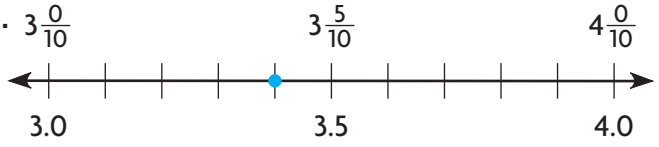
_____ _____

5. 

_____ _____

6. 

_____ _____

7. 

_____ _____

Practice: Copy and Solve Write the fraction or mixed number as a decimal.

8. $5\frac{9}{10}$
9. $\frac{1}{10}$
10. $\frac{7}{10}$
11. $8\frac{9}{10}$
12. $\frac{6}{10}$
13. $6\frac{3}{10}$
14. $\frac{5}{10}$
15. $9\frac{7}{10}$

Problem Solving REAL WORLD

Use the table for 16–19.

16. What part of the rocks listed in the table are igneous? Write your answer as a decimal.

17. Sedimentary rocks make up what part of Ramon's collection? Write your answer as a fraction and in word form.

18. What part of the rocks listed in the table are metamorphic? Write your answer as a fraction and as a decimal.

19. H.O.T. **What's the Error?** Niki wrote the following sentence in her report: "Metamorphic rocks make up 2.0 of Ramon's rock collection." Describe her error.

20. H.O.T. Josh paid for three books with two $20 bills. He received $1 in change. Each book was the same price. How much did each book cost?

21. **Test Prep** Rosa has a bookshelf where she stores her book collection. Four tenths of her books are mystery books. What is this amount written as a decimal?

Ⓐ 40.0 Ⓒ 0.4

Ⓑ 4.0 Ⓓ 0.04

Ramon's Rock Collection

Name	Type
Basalt	Igneous
Rhyolite	Igneous
Granite	Igneous
Peridotite	Igneous
Scoria	Igneous
Shale	Sedimentary
Limestone	Sedimentary
Sandstone	Sedimentary
Mica	Metamorphic
Slate	Metamorphic

▲ Granite– Igneous

▲ Mica–Metamorphic

▲ Sandstone– Sedimentary

SHOW YOUR WORK

Name _____

Relate Hundredths and Decimals

Essential Question How can you record hundredths as fractions and decimals?

UNLOCK the Problem REAL WORLD

In the 2008 Summer Olympic Games, the winning time in the men's 100-meter butterfly race was only $\frac{1}{100}$ second faster than the second-place time. What decimal represents this fraction of a second?

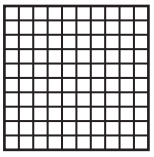
You can write hundredths as fractions or decimals.

- Circle the numbers you need to use.

One Way Use a model and a place-value chart.

Fraction

Shade $\frac{1}{100}$ of the model.



Think: The model is divided into 100 equal parts. Each part represents one **hundredth**.

Write: _____

Read: one hundredth

Decimal

Complete the place-value chart. $\frac{1}{100}$ is 1 hundredth.

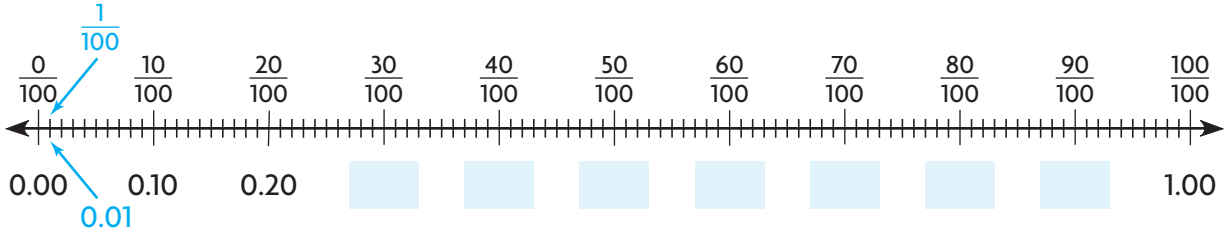
Ones	.	Tenths	Hundredths
0	.	0	1

Write: _____

Read: one hundredth

Another Way Use a number line.

Label the number line with equivalent decimals. Locate the point $\frac{1}{100}$.



_____ names the same amount as $\frac{1}{100}$.

So, the winning time was _____ second faster.

MATHEMATICAL PRACTICES

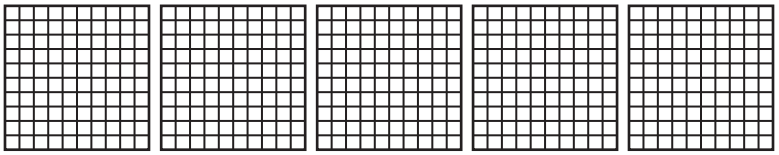
Math Talk **Explain** how the size of one tenth is related to the size of one hundredth.

Alicia won her 400-meter freestyle race by $4\frac{25}{100}$ seconds. How can you write this mixed number as a decimal?

One Way Use a model and a place-value chart.

Mixed Number

Shade the model to show $4\frac{25}{100}$.



Write: _____

Read: four and twenty-five hundredths

Decimal

Complete the place-value chart.

Think: Look at the model above. $4\frac{25}{100}$ is 4 wholes and 2 tenths 5 hundredths.

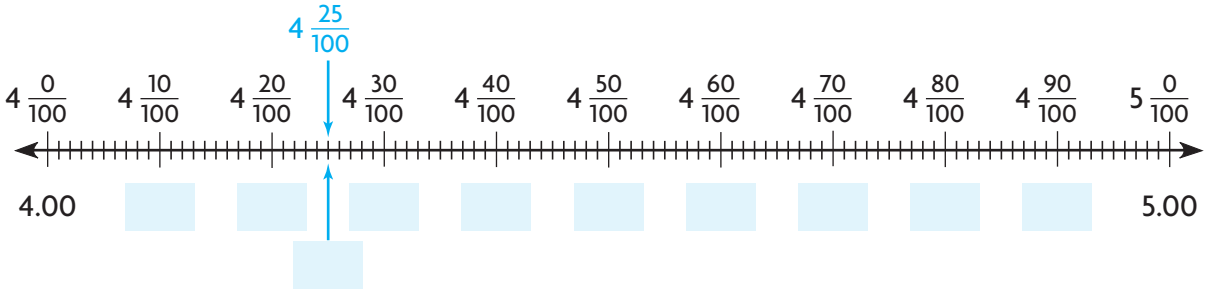
Ones	.	Tenths	Hundredths
	.		

Write: _____

Read: _____

Another Way Use a number line.

Label the number line with equivalent mixed numbers and decimals. Locate the point $4\frac{25}{100}$.



_____ names the same amount as $4\frac{25}{100}$.

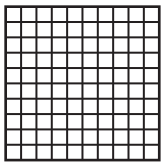
So, Alicia won her race by _____ seconds.

Name _____

Share and Show MATH BOARD

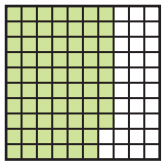
1. Shade the model to show $\frac{31}{100}$.

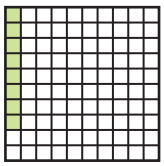
Write the amount as a decimal. _____



Ones	.	Tenths	Hundredths
	.		

Write the fraction or mixed number and the decimal shown by the model.

2. 

3. 

4. $6\frac{0}{100}$ $6\frac{50}{100}$ $7\frac{0}{100}$

6.00 6.50 7.00

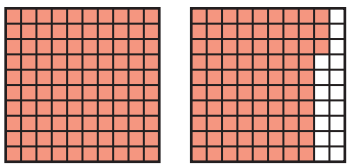
_____ _____

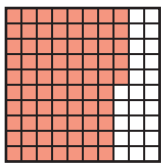
Math Talk MATHEMATICAL PRACTICES

Are 0.5 and 0.50 equivalent? **Explain**.

On Your Own

Write the fraction or mixed number and the decimal shown by the model.

5. 

6. 

7. $\frac{0}{100}$ $\frac{50}{100}$ $\frac{100}{100}$

0.00 0.50 1.00

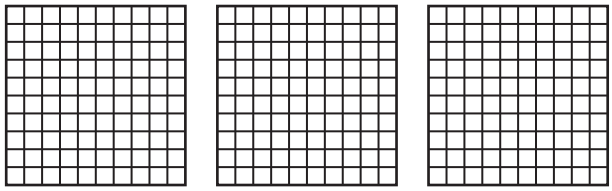
_____ _____

Practice: Copy and Solve Write the fraction or mixed number as a decimal.

8. $\frac{9}{100}$ 9. $4\frac{55}{100}$ 10. $\frac{10}{100}$ 11. $9\frac{33}{100}$ 12. $\frac{92}{100}$ 13. $14\frac{16}{100}$

Problem Solving REAL WORLD

14. H.O.T. Shade the grids to show three different ways to represent $\frac{16}{100}$ using models.



15. Write Math **Explain** how one whole, one tenth, and one hundredth are related.

16. **Test Prep** A stained glass window has 100 same-size squares. If 23 squares are red, what part of the stained glass window is red?

Ⓐ 230 Ⓑ 23 Ⓒ 2.3 Ⓓ 0.23

Sense or Nonsense?

17. The Memorial Library is 0.3 mile from school. Whose statement makes sense? Whose statement is nonsense? **Explain** your reasoning.

Name _____

Equivalent Fractions and Decimals

Essential Question How can you record tenths and hundredths as fractions and decimals?

UNLOCK the Problem REAL WORLD

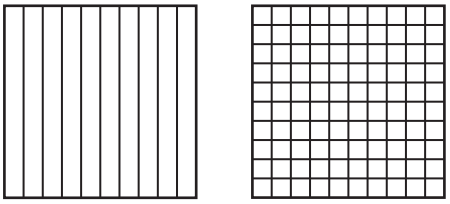
Daniel spent a day hiking through a wildlife preserve. During the first hour of the hike, he drank $\frac{6}{10}$ liter of water. How many hundredths of a liter did he drink?

- Underline what you need to find.
- How can you represent hundredths?

_____

One Way Write $\frac{6}{10}$ as an equivalent fraction with a denominator of 100.

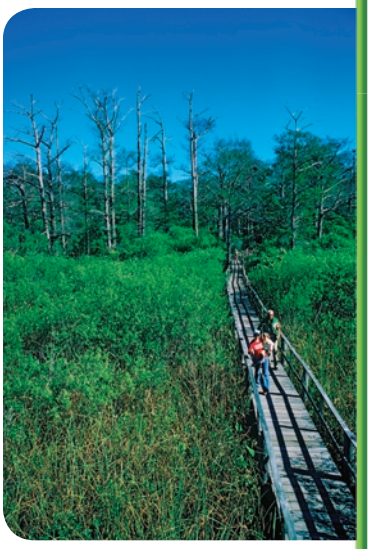
MODEL



$\frac{6}{10} = \frac{\square}{100}$

RECORD

$\frac{6}{10} = \frac{6 \times \square}{10 \times \square} = \frac{\square}{100}$



Another Way Write $\frac{6}{10}$ as a decimal.

Think: 6 tenths is the same as 6 tenths 0 hundredths.

Ones	.	Tenths	Hundredths

So, Daniel drank _____, or _____ liter of water.

MATHEMATICAL PRACTICES

Math Talk **Explain** how you can write 0.2 as hundredths.

- **Explain** why 6 tenths is equivalent to 60 hundredths.

_____

_____

Jasmine collected 0.30 liter of water in a jar during a rainstorm. How many tenths of a liter did she collect?

Equivalent decimals are decimals that name the same amount. You can write 0.30 as a decimal that names tenths.

One Way Write 0.30 as an equivalent decimal.

Show 0.30 in the place-value chart.

Ones	.	Tenths	Hundredths

Think: There are no hundredths.

0.30 is equivalent to _____ tenths.

Write 0.30 as _____.

Another Way Write 0.30 as a fraction with a denominator of 10.

STEP 1 Write 0.30 as a fraction.

0.30 is _____ hundredths.

30 hundredths written as a fraction is _____.

STEP 2 Write $\frac{30}{100}$ as an equivalent fraction with a denominator of 10.

Think: 10 is a common factor of the numerator and the denominator.

$$\frac{30}{100} = \frac{30 \div \square}{100 \div \square} = \frac{\square}{10}$$

So, Jasmine collected _____, or _____ liter of water.

Share and Show MATH BOARD

1. Write $\frac{4}{10}$ as hundredths.

Write $\frac{4}{10}$ as an equivalent fraction.

$$\frac{4}{10} = \frac{4 \times \square}{10 \times \square} = \frac{\square}{100}$$

Fraction: _____

Write $\frac{4}{10}$ as a decimal.

Ones	.	Tenths	Hundredths
	.		

Decimal: _____

Name _____

Write the number as hundredths in fraction form and decimal form.

2. $\frac{7}{10}$

3. 0.5

4. $\frac{3}{10}$

Write the number as tenths in fraction form and decimal form.

5. 0.40

6. $\frac{80}{100}$

7. $\frac{20}{100}$

On Your Own

MATHEMATICAL PRACTICES

Math Talk Can you write 0.25 as tenths? **Explain.**

Practice: Copy and Solve Write the number as hundredths in fraction form and decimal form.

8. $\frac{8}{10}$

9. $\frac{2}{10}$

10. 0.1

Practice: Copy and Solve Write the number as tenths in fraction form and decimal form.

11. $\frac{60}{100}$

12. $\frac{90}{100}$

13. 0.70

H.O.T. **Write the number as an equivalent mixed number with hundredths.**

14. $1\frac{4}{10}$

15. $3\frac{5}{10}$

16. $2\frac{9}{10}$

Problem Solving REAL WORLD

17. H.O.T. **What's the Error?** Carter says that 0.08 is equivalent to $\frac{8}{10}$. Describe and correct Carter's error.

18. **Test Prep** David walked 0.5 kilometer from his home to the library. Which fraction is equivalent to 0.5?

Ⓐ $\frac{5}{100}$ Ⓒ $\frac{55}{100}$

Ⓑ $\frac{50}{100}$ Ⓓ $\frac{50}{10}$

Connect to Science

Inland Water

How many lakes and rivers does your state have? The U.S. Geological Survey defines inland water as water that is surrounded by land. The Atlantic Ocean, the Pacific Ocean, and the Great Lakes are not considered inland water.

19. Write Math Just over $\frac{2}{100}$ of the entire United States is inland water. Write $\frac{2}{100}$ as a decimal.

20. Can you write 0.02 as tenths? **Explain.**

21. About 0.17 of the area of Rhode Island is inland water. Write 0.17 as a fraction.

22. Louisiana's lakes and rivers cover about $\frac{1}{10}$ of the state. Write $\frac{1}{10}$ as hundredths in fraction form and decimal form.

Name _____

Relate Fractions, Decimals, and Money

Essential Question How can you relate fractions, decimals, and money?

UNLOCK the Problem REAL WORLD

Together, Julie and Sarah have $1.00 in quarters. They want to share the quarters equally. How many quarters should each girl get? How much money is this?

Remember

1 dollar = 100 cents
1 quarter = 25 cents
1 dime = 10 cents
1 penny = 1 cent

Use the model to relate money, fractions, and decimals.

4 quarters = 1 dollar = $1.00

$0.25 $0.25 $0.25 $0.25

1 quarter is $\frac{25}{100}$, or $\frac{1}{4}$ of a dollar.

2 quarters are $\frac{50}{100}$, $\frac{2}{4}$, or $\frac{1}{2}$ of a dollar.

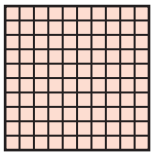
$\frac{1}{2}$ of a dollar = $0.50, or 50 cents.

Circle the number of quarters each girl should get.

So, each girl should get 2 quarters, or $ _____.

Examples Use money to model decimals.

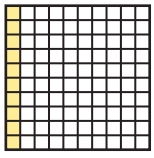
1 dollar



$1.00, or

_____ cents

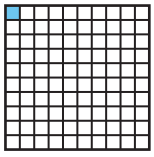
10 dimes = 1 dollar



1 dime = $\frac{1}{10}$, or 0.10 of a dollar

$ _____, or 10 cents

100 pennies = 1 dollar



1 penny = $\frac{1}{100}$, or 0.01 of a dollar

$ _____, or 1 cent

MATHEMATICAL PRACTICES

Math Talk If you have 68 pennies, what part of a dollar do you have? **Explain.**

Relate Money and Decimals Think of dollars as ones, dimes as tenths, and pennies as hundredths.

$1.56

Dollars	.	Dimes	Pennies
1	.	5	6

Think: $1.56 = 1 dollar and 56 pennies

There are 100 pennies in 1 dollar.
So, $1.56 = 156 pennies.

1.56 dollars

Ones	.	Tenths	Hundredths
1	.	5	6

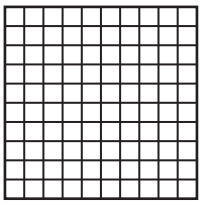
Think: 1.56 = 1 one and 56 hundredths

There are 100 hundredths in 1 one.
So, 1.56 = 156 hundredths.

More Examples

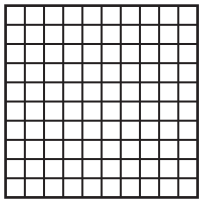
Shade the decimal model to show the money amount. Then write the money amount and a fraction in terms of dollars.

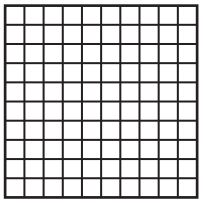
A



_____, or $\frac{21}{100}$ of a dollar

B





$1.46, or $1\frac{\square}{100}$ dollars

Try This! **Complete the table to show how money, fractions, mixed numbers, and decimals are related.**

$ Bills and Coins	Money Amount	Fraction or Mixed Number	Decimal
	$0.03		0.03
	$0.25	$\frac{25}{100}$, or $\frac{1}{4}$	
2 quarters 1 dime		$\frac{60}{100}$, or $\frac{6}{10}$	
2 $1 bills 5 nickels			

MATHEMATICAL PRACTICES

Math Talk Would you rather have $0.25 or $\frac{3}{10}$ of a dollar? **Explain.**

Name _____

Share and Show

1. Write the amount of money as a decimal in terms of dollars.

5 pennies = $\frac{5}{100}$ of a dollar = _____ of a dollar.

Write the total money amount. Then write the amount as a fraction or a mixed number and as a decimal in terms of dollars.

2. 

_____ _____ _____

3. 

_____ _____ _____

Write as a money amount and as a decimal in terms of dollars.

4. $\frac{92}{100}$ _____ _____

5. $\frac{7}{100}$ _____ _____

6. $\frac{16}{100}$ _____ _____

7. $\frac{53}{100}$ _____ _____

MATHEMATICAL PRACTICES

Math Talk **Explain** how \$0.84 and $\frac{84}{100}$ of a dollar are related.

On Your Own

Write the total money amount. Then write the amount as a fraction or a mixed number and as a decimal in terms of dollars.

8. 

_____ _____ _____

9. 

_____ _____ _____

10. 

_____ _____ _____

11. 

_____ _____ _____

Write as a money amount and as a decimal in terms of dollars.

12. $\frac{27}{100}$ _____ _____

13. $\frac{4}{100}$ _____ _____

14. $\frac{75}{100}$ _____ _____

15. $\frac{100}{100}$ _____ _____

Write the money amount as a fraction in terms of dollars.

16. $0.68 _____ **17.** $0.20 _____ **18.** $0.89 _____ **19.** $0.47 _____

Write the total money amount. Then write the amount as a fraction and as a decimal in terms of dollars.

20. 1 quarter 6 dimes 8 pennies

_____ _____ _____

21. 3 dimes 5 nickels 20 pennies

_____ _____ _____

H.O.T. **Algebra** **Complete to tell the value of each digit.**

22. $1.05 = _____ dollar + _____ pennies, 1.05 = _____ one + _____ hundredths

23. $5.18 = _____ dollars + _____ dime + _____ pennies

5.18 = _____ ones + _____ tenth + _____ hundredths

Problem Solving REAL WORLD

Use the table for 24–25.

Pocket Change

Name	Quarters	Dimes	Nickels	Pennies
Kim	1	3	2	3
Tony	0	6	1	6
Nick	2	4	0	2

24. The table shows the coins three students have. Write Nick's total amount as a fraction in terms of dollars.

_____

25. H.O.T. Kim spent $\frac{40}{100}$ of a dollar on a snack. Write as a money amount the amount she has left.

_____

26. Write Math Travis has $\frac{1}{2}$ of a dollar. He has at least two different types of coins in his pocket. **Draw** two possible sets of coins that Travis could have.

27. **Test Prep** Mia has two dollars and fifteen cents. What decimal names this money amount in terms of dollars?

Ⓐ 21.50 Ⓒ 2.15

Ⓑ 2.50 Ⓓ 0.15

Name _____

Problem Solving • Money

Essential Question How can you use the strategy *act it out* to solve problems that use money?

UNLOCK the Problem REAL WORLD

Together, Marnie and Serena have $1.20. They want to share the money equally. How much money will each girl get?

Use the graphic organizer to solve the problem.

Read the Problem

What do I need to find?

I need to find the _____

_____

What information do I need to use?

I need to use the total amount, _____, and

divide the amount into _____ equal parts.

How will I use the information?

I will use coins to model the _____ and

act out the problem.

Solve the Problem

You can make $1.20 with 4 quarters

and 2 _____.

Circle the coins to show two sets with equal value.

So, each girl gets _____ quarters and

_____ dime. Each girl gets $_____.

- **Describe** another way you could act out the problem with coins.

_____

_____

Try Another Problem

Josh, Tom, and Chuck each have $0.40. How much money do they have together?

Read the Problem	Solve the Problem
What do I need to find?	
What information do I need to use?	
How will I use the information?	

- How can you solve the problem using dimes and nickels?

MATHEMATICAL PRACTICES

Math Talk What other strategy might you use to solve the problem? **Explain.**

Name _____

Share and Show

MATH BOARD

UNLOCK the Problem Tips

- Circle the question.
- Underline the important facts.
- Cross out unneeded information.

1. Juan has $3.43. He is buying a paint brush that costs $1.21 to paint a model race car. How much will Juan have after he pays for the paint brush?

First, use bills and coins to model $3.43.

Next, you need to subtract. Remove bills and coins that have a value of $1.21. Mark Xs to show what you remove.

Last, count the value of the bills and coins that are left. How much will Juan have left?

_____

2. H.O.T. **What if** Juan has $3.43, and he wants to buy a paint brush that costs $2.28? How much money will Juan have left then? **Explain**.

_____

_____

_____

_____

_____

3. Sophia has $2.25. She wants to give an equal amount to each of her 3 young cousins. How much will each cousin receive?

_____

SHOW YOUR WORK

On Your Own

Choose a STRATEGY

- Act It Out
- Draw a Diagram
- Find a Pattern
- Make a Table or List
- Solve a Simpler Problem

SHOW YOUR WORK

4. Marcus saves $13 each week. In how many weeks will he have saved at least $100?

5. Hoshi has $50. Emily has $23 more than Hoshi. Karl has $16 less than Emily. How much money do they have all together?

6. **Write Math** Four girls have $5.00 to share equally. How much money will each girl get? **Explain**.

7. **H.O.T.** **What if** four girls want to share $5.52 equally? How much money will each girl get? **Explain.**

8. **Test Prep** Which does **not** represent the value of 3 quarters and 3 dimes?

   Ⓐ $1.05
   Ⓒ $1\frac{5}{10}$ dollars
   Ⓑ $1\frac{5}{100}$ dollars
   Ⓓ 1.05 dollars

FOR MORE PRACTICE:
Standards Practice Book, pp. P179–P180

Name _____

Mid-Chapter Checkpoint

Vocabulary

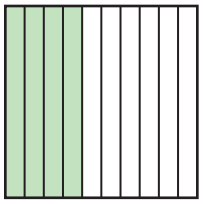
Choose the best term from the box to complete the sentence.

Vocabulary
decimal
decimal point
hundred
hundredth

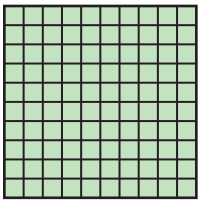
1. A symbol used to separate the ones and the tenths place is called a _____. (p. 343)
2. The number 0.4 is written as a _____. (p. 343)
3. A _____ is one of one hundred equal parts of a whole. (p. 347)

Concepts and Skills

Write the fraction or mixed number and the decimal shown by the model.

4. 

_____ _____

5. 

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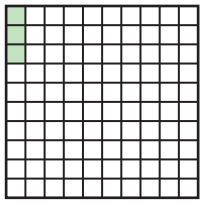


_____

Write the number as hundredths in fraction form and decimal form.

6. $\frac{8}{10}$

_____

7. 0.5

_____

8. $\frac{6}{10}$

_____

Write the fraction or mixed number as a money amount, and as a decimal in terms of dollars.

9. $\frac{65}{100}$

_____

10. $1\frac{48}{100}$

_____

11. $\frac{4}{100}$

_____

Fill in the bubble completely to show your answer.

12. Ken's turtle competed in a 0.50-meter race. His turtle had traveled $\frac{49}{100}$ meter when the winning turtle crossed the finish line. What is $\frac{49}{100}$ written as a decimal?

Ⓐ 4.90 Ⓒ 0.40

Ⓑ 0.49 Ⓓ 0.09

13. Alex lives eight tenths of a mile from Sarah. What is eight tenths written as a decimal?

Ⓐ 80.0 Ⓒ 0.8

Ⓑ 8.0 Ⓓ 0.08

14. Which two fractions are equivalent?

Ⓐ $\frac{1}{10}$ and $\frac{1}{100}$ Ⓒ $\frac{10}{100}$ and $\frac{1}{100}$

Ⓑ $\frac{10}{10}$ and $\frac{10}{100}$ Ⓓ $\frac{1}{10}$ and $\frac{10}{100}$

15. Elaine found the following in her pocket. How much money was in her pocket?

Ⓐ $1.04 Ⓒ $1.40

Ⓑ $1.30 Ⓓ $1.45

16. Three girls share $0.60. Each girl gets the same amount. How much money does each girl get?

Ⓐ $0.30 Ⓒ $0.20

Ⓑ $0.25 Ⓓ $0.02

17. The deli scale weighs meat and cheese in hundredths of a pound. Sam put $\frac{5}{10}$ pound of pepperoni on the deli scale. What weight does the deli scale show?

Ⓐ 0.05 pound Ⓒ 0.50 pound

Ⓑ 0.10 pound Ⓓ 5.0 pound

Name _____

Add Fractional Parts of 10 and 100

Essential Question How can you add fractions when the denominators are 10 or 100?

UNLOCK the Problem REAL WORLD

The fourth grade classes are painting designs on tile squares to make a mural. Mrs. Kirk's class painted $\frac{3}{10}$ of the mural. Mr. Becker's class painted $\frac{21}{100}$ of the mural. What part of the mural is painted?

You know how to add fractions with parts that are the same size. You can use equivalent fractions to add fractions with parts that are not the same size.

Example 1 Find $\frac{3}{10} + \frac{21}{100}$.

STEP 1 Write $\frac{3}{10}$ and $\frac{21}{100}$ as a pair of fractions with a common denominator.

Think: 100 is a multiple of 10. Use 100 as the common denominator.

$$\frac{3}{10} = \frac{3 \times \square}{10 \times \square} = \frac{\square}{100}$$

Think: $\frac{21}{100}$ already has 100 in the denominator.

STEP 2 Add.

Think: Write $\frac{3}{10} + \frac{21}{100}$ using fractions with a common denominator.

$$\frac{30}{100} + \frac{21}{100} = \frac{\square}{100}$$

So, $\frac{\square}{100}$ of the mural is painted.

MATHEMATICAL PRACTICES

Math Talk When adding tenths and hundredths, can you always use 100 as a common denominator? **Explain.**

Try This! Find $\frac{4}{100} + \frac{1}{10}$.

A Write $\frac{1}{10}$ as $\frac{10}{100}$.

$$\frac{1}{10} = \frac{1 \times \square}{10 \times \square} = \frac{\square}{100}$$

B Add.

$$\frac{\square}{100} + \frac{10}{100} = \frac{\square}{100}$$

So, $\frac{4}{100} + \frac{10}{100} = \frac{14}{100}$

Example Add decimals.

Sean lives 0.5 mile from the store. The store is 0.25 mile from his grandmother's house. Sean is going to walk to the store and then to his grandmother's house. How far will he walk?

Find 0.5 + 0.25.

STEP 1 Write 0.5 + 0.25 as a sum of fractions.

Think: 0.5 is 5 tenths. **Think:** 0.25 is 25 hundredths.

$0.5 = \frac{\square}{\square}$ $0.25 = \frac{\square}{\square}$

Write 0.5 + 0.25 as $\frac{\square}{\square} + \frac{\square}{\square}$

STEP 2 Write $\frac{5}{10} + \frac{25}{100}$ as a sum of fractions with a common denominator.

Think: Use 100 as a common denominator. Rename $\frac{5}{10}$.

$\frac{5}{10} = \frac{5 \times \square}{10 \times \square} = \frac{\square}{100}$

Write $\frac{5}{10} + \frac{25}{100}$ as $\frac{\square}{\square} + \frac{\square}{\square}$.

STEP 3 Add.

$\frac{50}{100} + \frac{25}{100} = \frac{\square}{\square}$

STEP 4 Write the sum as a decimal.

$\frac{75}{100} = \_\_\_\_$

So, Sean will walk _____ mile.

MATHEMATICAL PRACTICES

Math Talk **Explain** why you can think of \$0.25 as either $\frac{1}{4}$ dollar or $\frac{25}{100}$ dollar.

Try This! **Find \$0.25 + \$0.40.**

\$0.25 + \$0.40 = _____

Remember

A money amount less than a dollar can be written as a fraction of a dollar.

Name _____

Share and Show

1. Find $\frac{7}{10} + \frac{5}{100}$.

Think: Write the addends as fractions with a common denominator.

$\frac{\square}{100} + \frac{\square}{100} = \frac{\square}{\square}$

Find the sum.

2. $\frac{1}{10} + \frac{11}{100} =$ _____

3. $\frac{36}{100} + \frac{5}{10} =$ _____

4. $\$0.16 + \$0.45 = \$$_____

5. $\$0.08 + \$0.88 = \$$_____

On Your Own

6. $\frac{6}{10} + \frac{25}{100} =$ _____

7. $\frac{7}{10} + \frac{7}{100} =$ _____

8. $\frac{19}{100} + \frac{4}{10} =$ _____

9. $\frac{3}{100} + \frac{9}{10} =$ _____

10. $\$0.55 + \$0.23 = \$$_____

11. $\$0.19 + \$0.13 = \$$_____

H.O.T. **Algebra** Write the number that makes the equation true.

12. $\frac{20}{100} + \frac{\square}{10} = \frac{60}{100}$

13. $\frac{2}{10} + \frac{\square}{100} = \frac{90}{100}$

Problem Solving REAL WORLD

Use the table for 14–17.

Paving Stone Center	
Style	**Length (in meters)**
Rustic	$\frac{15}{100}$
Teakwood	$\frac{3}{10}$
Buckskin	$\frac{41}{100}$
Rainbow	$\frac{6}{10}$
Rose	$\frac{8}{100}$

14. Dean selects Teakwood stones and Buckskin stones to pave a path in front of his house. How many meters long will each set of one Teakwood stone and one Buckskin stone be?

15. The backyard patio at Nona's house is made from a repeating pattern of one Rose stone and one Rainbow stone. How many meters long is each pair of stones?

16. H.O.T. For a stone path, Emily likes the look of a Rustic stone, then a Rainbow stone, and then another Rustic stone. How long will the three stones in a row be? **Explain.**

17. Write Math Which two stones can you place end-to-end to get a length of 0.38 meters? **Explain** how you found your answer.

SHOW YOUR WORK

18. **Test Prep** Which is the sum of $\frac{6}{10}$ and $\frac{2}{100}$?

Ⓐ $\frac{8}{10}$ Ⓒ $\frac{62}{10}$

Ⓑ $\frac{62}{100}$ Ⓓ $\frac{8}{100}$

Name _____

Compare Decimals

Essential Question How can you compare decimals?

UNLOCK the Problem REAL WORLD

The city park covers 0.64 square mile. About 0.18 of the park is covered by water, and about 0.2 of the park is covered by paved walkways. Is more of the park covered by water or paved walkways?

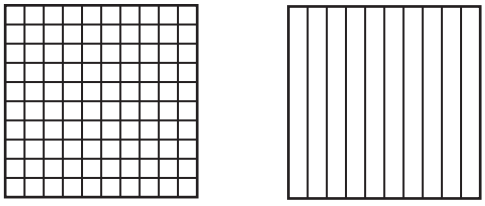
- Cross out unnecessary information.
- Circle numbers you will use.
- What do you need to find?

_____

_____

One Way Use a model.

Shade 0.18. Shade 0.2.



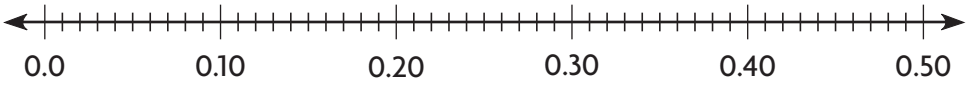
0.18 ◯ 0.2

Other Ways

A Use a number line.

Locate 0.18 and 0.2 on a number line.

Think: 2 tenths is equivalent to 20 hundredths.



_____ is closer to 0, so 0.18 ◯ 0.2.

B Compare equal-size parts.

- 0.18 is _____ hundredths.
- 0.2 is 2 tenths, which is equivalent to _____ hundredths.

18 hundredths ◯ 20 hundredths, so 0.18 ◯ 0.2.

So, more of the park is covered by _____.

MATHEMATICAL PRACTICES

Math Talk How does the number of tenths in 0.18 compare to the number of tenths in 0.2? **Explain.**

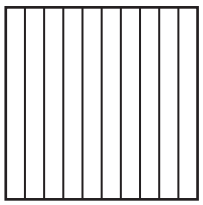
Place Value You can compare numbers written as decimals by using place value. Comparing decimals is like comparing whole numbers. Always compare the digits in the greatest place-value position first.

Example Use place value.

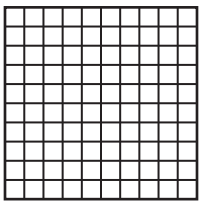
Tim has 0.5 dollar, and Sienna has 0.05 dollar. Who has more money?

MODEL

Tim



Sienna



So, _____ has more money.

RECORD

Ones	.	Tenths	Hundredths
	.		
	.		

← Tim

← Sienna

Think: The digits in the ones place are the same. Compare the digits in the tenths place.

5 tenths ◯ 0 tenths, so 0.5 ◯ 0.05.

- Compare the size of 1 tenth to the size of 1 hundredth. How could this help you compare 0.5 and 0.05? **Explain.**

_____

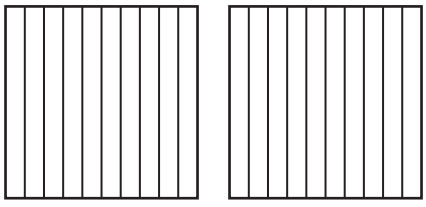
_____

_____

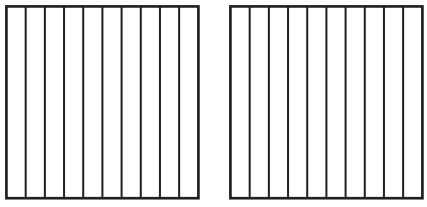
Try This! **Compare 1.3 and 0.6. Write <, >, or =.**

1.3 ◯ 0.6

Shade to model 1.3.



Shade to model 0.6.



MATHEMATICAL PRACTICES

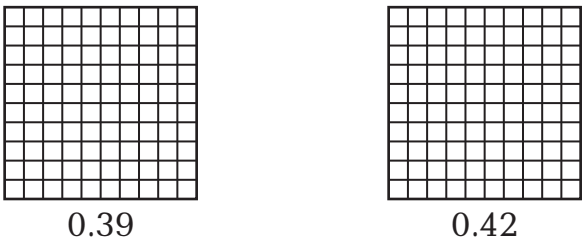
Math Talk **Explain** how you could use place value to compare 1.3 and 0.6.

Name _____

Share and Show

1. Compare 0.39 and 0.42. Write <, >, or =. Shade the model to help.

0.39 ◯ 0.42



0.39 0.42

Compare. Write <, >, or =.

2. 0.26 ◯ 0.23

Ones	.	Tenths	Hundredths
	.		
	.		

3. 0.7 ◯ 0.54

Ones	.	Tenths	Hundredths
	.		
	.		

4. 1.15 ◯ 1.3

Ones	.	Tenths	Hundredths
	.		
	.		

5. 4.5 ◯ 2.89

Ones	.	Tenths	Hundredths
	.		
	.		

MATHEMATICAL PRACTICES

Math Talk Can you compare 0.39 and 0.42 by comparing only the tenths? **Explain.**

On Your Own

Compare. Write <, >, or =.

6. 0.9 ◯ 0.81
7. 1.06 ◯ 0.6
8. 0.25 ◯ 0.3
9. 2.61 ◯ 3.29
10. 0.38 ◯ 0.83
11. 1.9 ◯ 0.99
12. 1.11 ◯ 1.41
13. 0.8 ◯ 0.80

H.O.T. Compare. Write <, >, or =.

14. 0.30 ◯ $\frac{3}{10}$
15. $\frac{4}{100}$ ◯ 0.2
16. 0.15 ◯ $\frac{1}{10}$
17. $\frac{1}{8}$ ◯ 0.8

UNLOCK the Problem REAL WORLD

18. Ricardo and Brandon ran a 1500-meter race. Ricardo finished in 4.89 minutes. Brandon finished in 4.83 minutes. What was the time of the runner who finished first?

Ⓐ 15.00 minutes

Ⓑ 4.89 minutes

Ⓒ 4.83 minutes

Ⓓ Ricardo and Brandon tied for first.

a. What are you asked to find? _____

_____

b. What do you need to do to find the answer? _____

_____

c. Solve the problem.

d. Fill in the bubble for the correct answer choice above.

e. Look back. Does your answer make sense? Explain.

_____

_____

_____

_____

_____

_____

19. Which of the following is less than $3.68?

Ⓐ $3.97

Ⓑ $4.57

Ⓒ $3.59

Ⓓ $4.68

20. Which of the following is greater than 14.24?

Ⓐ 13.99

Ⓑ 14.19

Ⓒ 13.24

Ⓓ 14.34

FOR MORE PRACTICE:
Standards Practice Book, pp. P183–P184

Name _____

Chapter Review/Test

Vocabulary

Choose the best term from the box.

Vocabulary
decimal
decimal point
hundredth
tenth

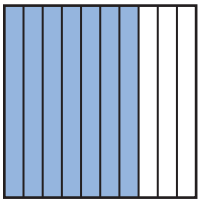
1. One of ten equal parts is one _____. (p. 343)

2. A _____ is a symbol used to separate dollars from cents in money amounts and to separate the ones and the tenths places in decimals. (p. 343)

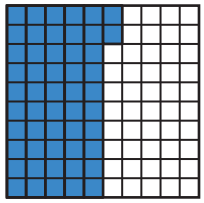
3. A _____ is a number with one or more digits to the right of the decimal point. (p. 343)

Concepts and Skills

Write the fraction and the decimal shown by the model.

4. 

_____ _____

5. 

_____ _____

Write the number as hundredths in fraction form and decimal form.

6. $\frac{9}{10}$ _____

7. $\frac{3}{10}$ _____

8. 0.2 _____

Find the sum.

9. $\frac{5}{10} + \frac{30}{100} =$ _____

10. $\frac{6}{10} + \frac{4}{100} =$ _____

11. $0.24 + 0.1 =$ _____

Compare. Write <, >, or =.

12. 3.45 ◯ 3.54

13. 1.7 ◯ 1.70

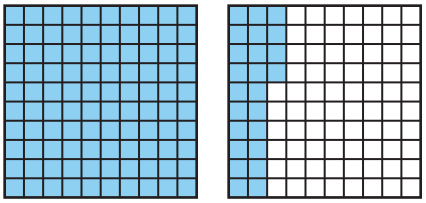
14. 8.1 ◯ 8.01

15. $4.25 ◯ $3.75

GO Online Assessment Options Chapter Test

Fill in the bubble completely to show your answer.

16. Which fraction or mixed number and decimal is shown by the model?



Ⓐ $\frac{24}{100}$, 0.24

Ⓑ $1\frac{24}{100}$, 1.24

Ⓒ $1\frac{76}{100}$, 1.76

Ⓓ $1\frac{24}{10}$, 1.24

17. Bethany collected 0.7 inch of rain in her rain gauge. How many hundredths of an inch did she collect?

Ones	.	Tenths	Hundredths
	.		

Ⓐ $\frac{7}{100}$

Ⓑ $\frac{70}{100}$

Ⓒ $\frac{7}{10}$

Ⓓ $\frac{7}{1}$

18. Pam paid for her lunch with the amount of money shown below.

How much money did she spend?

Ⓐ $2\frac{62}{100}$ dollars

Ⓑ $2\frac{77}{100}$ dollars

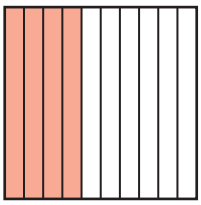
Ⓒ $2\frac{87}{100}$ dollars

Ⓓ $3\frac{2}{100}$ dollars

Name _____

Fill in the bubble completely to show your answer.

19. Carson shaded a model to represent the part of his book he read this weekend. Which decimal represents the part of the book he read?



Ⓐ 4.0

Ⓑ 0.44

Ⓒ 0.4

Ⓓ 0.04

20. Christelle is making a doll house. The doll house is $\frac{6}{10}$ meter high without the roof. The roof is $\frac{15}{100}$ meter high. What will the height of the doll house be, with the roof?

Ⓐ $\frac{21}{100}$ meter

Ⓑ $\frac{75}{100}$ meter

Ⓒ $1\frac{6}{100}$ meter

Ⓓ $\frac{60}{100}$ meter

21. Amie has three quarters and one nickel. If she and three girls share the money equally, what will each person get?

Ⓐ $0.10

Ⓑ $0.15

Ⓒ $0.20

Ⓓ $0.25

Constructed Response

22. There is $\frac{30}{100}$ of a liter of orange juice in one container and $\frac{5}{10}$ of a liter of pineapple juice in another container. If Mrs. Morales combines the two juices, how much orange-pineapple juice will she have? **Explain** how you found your answer.

23. Write the amount of orange-pineapple juice as a decimal.

Performance Task

24. Luke lives 0.4 kilometer from a skating rink. Mark lives 0.25 kilometer from the skating rink.

A Who lives closer to the skating rink? **Explain**.

B How can you write each distance as a fraction? **Explain**.

C Luke is walking to the skating rink to pick up a practice schedule. Then he is walking to Mark's house. Will he walk more than a kilometer or less than a kilometer? **Explain**.