

Relate Decimals and Fractions

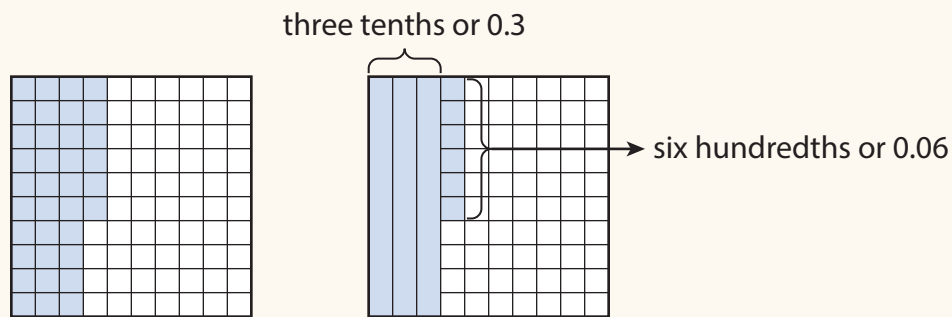


Dear Family,

This week your child is learning about relating decimals and fractions.

Tenths and hundredths can be written as decimal fractions.

You can use models to show the fraction $\frac{36}{100}$ as the **decimal** 0.36.



36 hundredths (0.36) is 3 tenths (0.3) and 6 hundredths (0.06).

You can use a place-value chart to write the mixed number $4\frac{36}{100}$ as a decimal.

decimal point
↓

Ones	.	Tenths	Hundredths
4	.	3	6

whole number number less than 1

Your child is learning to read the decimal 4.36:

1. Say the whole-number part, if there is one. *four*
2. Say *and* for the **decimal point**. *and*
3. Read the rest of the digits as a whole number. *thirty-six*
4. Say the place-value name of the last digit. *hundredths*

Say: *four and thirty-six hundredths.*

Invite your child to share what he or she knows about relating decimals and fractions by doing the following activity together.

ACTIVITY RELATING DECIMALS AND FRACTIONS

Do this activity with your child to relate decimals and fractions.

You can use money to relate decimals and fractions because money is counted in tenths and hundredths. There are 100 pennies in 1 dollar, so one penny is 0.01, or $\frac{1}{100}$, of a dollar. There are 10 dimes in 1 dollar, so one dime is 0.1 (or 0.10), or $\frac{1}{10}$, of a dollar.

- With your child, collect pennies from around your home. Have your child write the amount as a decimal and as a fraction.

Example: You have 23 pennies.

Write the decimal 0.23 and the fraction $\frac{23}{100}$.

Example: You have 30 pennies. Write the decimal 0.30 and the fraction $\frac{30}{100}$.

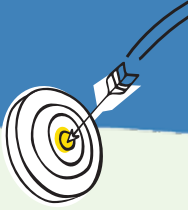


- Next, collect dimes from around your home and have your child write the amount as a decimal and as a fraction.



Look for other real-life opportunities to relate decimals and fractions with your child.

Explore Relating Decimals and Fractions



Learning Target

- Use decimal notation for fractions with denominators 10 or 100.

SMP 1, 2, 3, 4, 5, 6, 7, 8


You know how to write equivalent fractions with denominators of 10 and 100. In this lesson, you will learn another way to write these fractions. Use what you know to try to solve the problem below.

Max has 248 pennies. How many whole dollars does Max have? What fraction of a dollar is left over?

TRY IT



Math Toolkit

- base-ten blocks 
- play money
- hundredths grids
- index cards



DISCUSS IT

Ask your partner: Do you agree with me? Why or why not?

Tell your partner: I agree with you about ... because ...

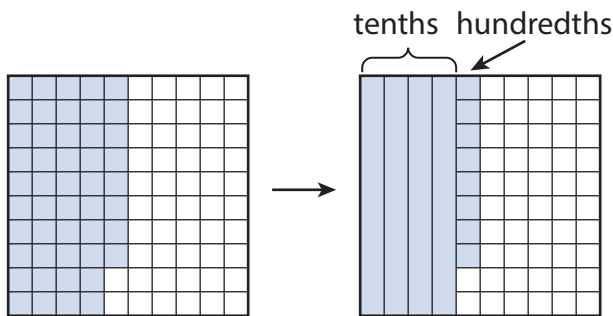
CONNECT IT

1 LOOK BACK

Write the dollars and fraction of a dollar Max has as a mixed number.

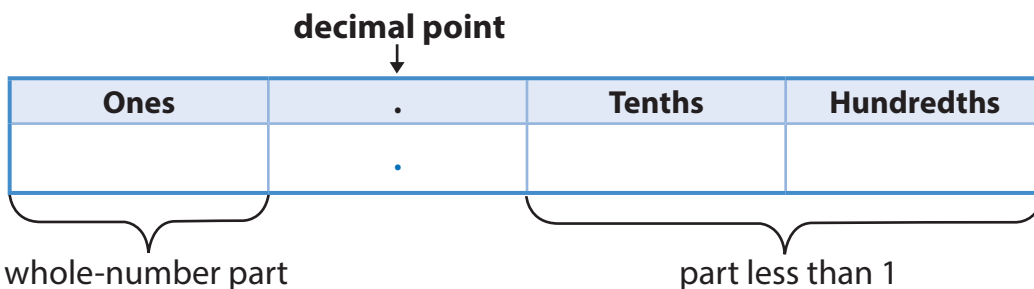
2 LOOK AHEAD

- a. Fractions with denominators 10 and 100 can be written as **decimals**. The models show the fraction $\frac{48}{100}$.



48 hundredths is tenths and hundredths.

- b. Write the mixed number $2\frac{48}{100}$ as a decimal in the place-value chart below.



- c. Fill in the blanks to tell how to read the decimal.

whole-number part in word form	decimal point	part less than 1 in word form	place-value name of the last digit
↓	↓	↓	↓
.....	and

3 REFLECT

Explain how thinking about money can help you understand decimals.

.....

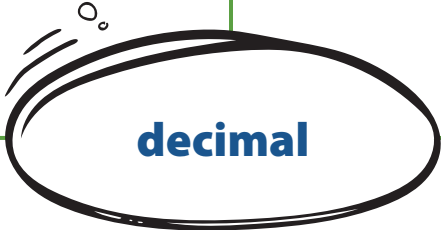
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Prepare for Relating Decimals and Fractions

- 1 Think about what you know about decimals. Fill in each box. Use words, numbers, and pictures. Show as many ideas as you can.

In My Own Words	My Illustrations
Examples	Non-Examples



decimal

- 2 Fill in the blanks to tell how to read the decimal 1.32.

whole-number
part in word form



.....

decimal
point



and

part less than 1
in word form



.....

place-value name
of the last digit



.....

- 3 Solve the problem. Show your work.

Lelia has 323 pennies. How many whole dollars does Lelia have? What fraction of a dollar is left over?

Solution

- 4 Check your answer. Show your work.



Develop Decimals and Fractions



Read and try to solve the problem below.

A soccer camp has places for 100 students. So far, 60 of the places are filled. Write both a fraction and a decimal in both hundredths and tenths to show the part of the 100 places for students that are filled.



TRY IT



Math Toolkit

- base-ten blocks
- hundredths grids
- tenths grids
- hundredths decimal place-value charts
- number lines



DISCUSS IT

Ask your partner: Can you explain that again?

Tell your partner: I started by ...

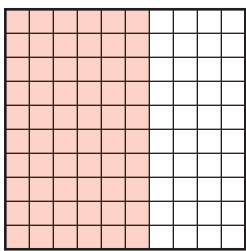
Explore different ways to understand how to use fractions and decimals to name the same amount.

A soccer camp has places for 100 students. So far, 60 of the places are filled. Write both a fraction and a decimal in both hundredths and tenths to show the part of the 100 places for students that are filled.

MODEL IT

You can use a model to understand how to write hundredths or tenths as a fraction and a decimal.

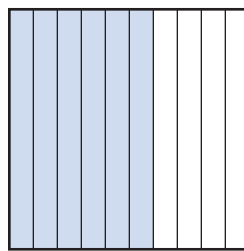
Each model represents the part of the 100 soccer camp places that are filled.



Each small square is $\frac{1}{100}$ of the whole.

Sixty small squares are shaded.

0.60 of the whole is shaded.



Each section is $\frac{1}{10}$ of the whole.

Six sections are shaded.

0.6 of the whole is shaded.

MODEL IT

You can use a place-value chart to understand how to write hundredths or tenths as a decimal.

The place-value chart shows the value of 0.60.

Ones	.	Tenths	Hundredths
0	.	6	0

CONNECT IT

Now you will use the problem from the previous page to help you understand how to write tenths and hundredths as fractions and decimals to name the same amount.

- 1 Look at the first **Model It**. The model on the left shows 60 squares shaded. Write a fraction for the model. The model on the right shows 6 sections shaded. Write a fraction for the model.
- 2 How does the model on the right in the first **Model It** show the fraction you wrote for the model in problem 1?
- 3 Look at the place-value chart in the second **Model It**. Write a decimal in tenths and the equivalent decimal in hundredths. How are the two decimals different?
- 4 Write a number on each line below to describe how decimals relate to fractions with denominators of 10 and 100.
If the denominator of a fraction is 10, the equivalent decimal has place after the decimal point.
If the denominator of a fraction is 100, the equivalent decimal has places after the decimal point.
- 5 **REFLECT**
Look back at your **Try It**, strategies by classmates, and **Model Its**. Which models or strategies do you like best for writing tenths and hundredths as fractions and decimals? Explain.

.....

.....

.....

.....

APPLY IT

Use what you just learned to solve these problems.

- 6 Write a decimal equivalent to $\frac{2}{10}$. Draw a model that shows the fraction and the decimal. Show your work.

Solution

- 7 Write a decimal equivalent to $\frac{83}{100}$. Show your work.

Solution

- 8 Write the mixed number $7\frac{9}{10}$ as a decimal. Show your work.

Solution

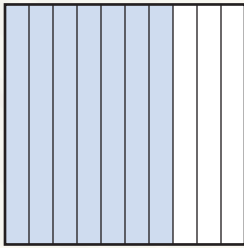
Practice Decimals and Fractions

Study the Example showing ways to name the same amount as a fraction and a decimal. Then solve problems 1–7.

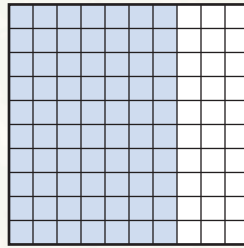
EXAMPLE

How do you write decimals equivalent to $\frac{7}{10}$ and $\frac{70}{100}$?

The model shows $\frac{7}{10}$.



The model shows $\frac{70}{100}$.



A place-value chart shows the value of $\frac{7}{10}$ and $\frac{70}{100}$.

Ones	.	Tenths	Hundredths
0	.	7	0

$$\frac{7}{10} = 0.7 \quad \frac{70}{100} = 0.70$$

- 1 Write the decimal equivalent to $\frac{3}{10}$ in the place-value chart.

Ones	.	Tenths
	.	

- 2 Write the decimal equivalent to $\frac{55}{100}$ in the place-value chart.

Ones	.	Tenths	Hundredths
	.		

- 3 Write a decimal equivalent to $\frac{75}{100}$

Vocabulary

decimal a number containing a decimal point that separates a whole from fractional place values (tenths, hundredths, and so on).

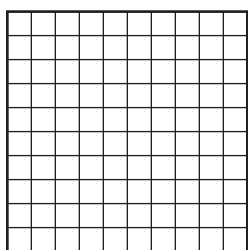
0.7 and 0.70 are decimals.

decimal point the dot used in a decimal that separates the ones place from the tenths place.

4 What is $2\frac{5}{10}$ written as a decimal?

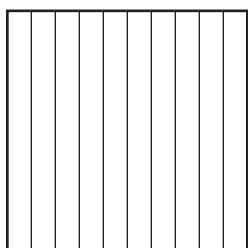
- (A) 0.25
- (B) 2.05
- (C) 2.5
- (D) 5.2

5 What decimal is equivalent to $\frac{80}{100}$? Shade the model below to show the fraction and the decimal. Then write the decimal.



$$\frac{80}{100} = \dots\dots\dots$$

6 Look at problem 5. Shade the model below to show an equivalent fraction and decimal in tenths. Then write the fraction and decimal.



$$\dots\dots\dots = \dots\dots\dots$$

7 Use what you know about equivalent fractions to explain why 0.8 and 0.80 are equivalent.

Develop Writing Decimals as Equivalent Fractions

Read and try to solve the problem below.

Eli collects animal cards. He says that 0.05 of his cards are endangered animal cards. What fraction of his cards are endangered animal cards?



TRY IT



Math Toolkit

- base-ten blocks
- hundredths grids
- hundredths decimal place-value charts
- number lines



DISCUSS IT

Ask your partner: Why did you choose that strategy?

Tell your partner: A model I used was . . . It helped me . . .

Explore different ways to understand how to write a decimal as an equivalent fraction.

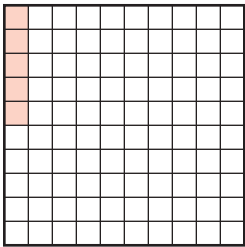


Eli collects animal cards. He says that 0.05 of his cards are endangered animal cards. What fraction of his cards are endangered animal cards?

MODEL IT

You can use a model to help write a decimal as an equivalent fraction.

The model shows 0.05.



MODEL IT

You can also use a place-value chart to help write a decimal as an equivalent fraction.

The place-value chart shows the value of 0.05.

Ones	.	Tenths	Hundredths
0	.	0	5

CONNECT IT

Now you will use the problem from the previous page to help you understand how to write a decimal as an equivalent fraction.

- 1 How can the model help you write a fraction equivalent to 0.05?

- 2 How can the place-value chart help you write a fraction equivalent to 0.05?

- 3 Use words to describe the fraction of Eli's cards that are endangered animal cards.

- 4 What fraction of Eli's cards are endangered animal cards?

- 5 Explain how you can write a decimal in hundredths as a fraction.

6 REFLECT

Look back at your **Try It**, strategies by classmates, and **Model Its**. Which models or strategies do you like best for writing a decimal in hundredths as an equivalent fraction? Explain.

.....

.....

.....

.....

APPLY IT

Use what you just learned to solve these problems.

- 7 Write 0.9 in words and as a fraction. Show your work.

Solution

- 8 Write 0.89 in words and as a fraction. Show your work.

Solution

- 9 Select all the fractions that are equivalent to 0.2.

Ⓐ $\frac{2}{100}$

Ⓑ $\frac{20}{100}$

Ⓒ $\frac{2}{10}$

Ⓓ $\frac{20}{10}$

Ⓔ $\frac{100}{2}$

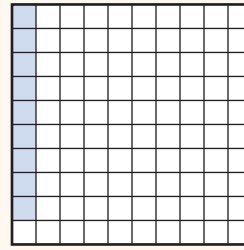
Ⓕ $\frac{10}{2}$

Practice Writing Decimals as Equivalent Fractions

Study the Example showing how to write a decimal as an equivalent fraction.
Then solve problems 1–8.

EXAMPLE

Alanna has an assortment of books in her bookcase. Comic books are 0.09 of the books. What fraction of the books are comic books?



Decimal: 0.09

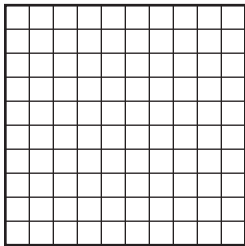
Words: nine hundredths

Fraction: $\frac{9}{100}$

Ones	.	Tenths	Hundredths
0	.	0	9

$\frac{9}{100}$ of the books are comic books.

- 1 Shade the model below to show 0.34.



- 2 Show 0.34 in the place-value chart.

Ones	.	Tenths	Hundredths
	.		

- 3 Write 0.34 in words.

- 4 Write 0.34 as a fraction.



5 Tell whether each statement is *True* or *False*.

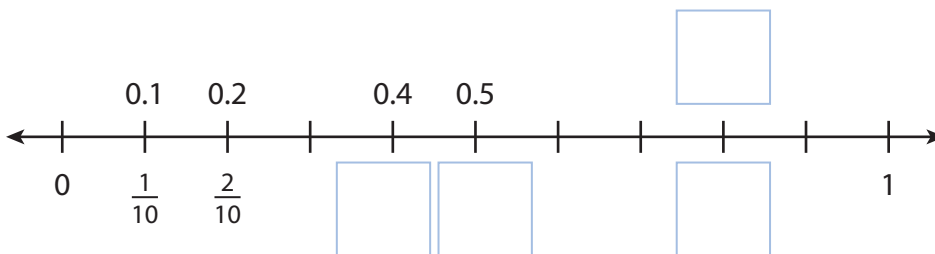
	True	False
$0.3 = \frac{3}{100}$	(A)	(B)
$0.03 = \frac{3}{100}$	(C)	(D)
$0.3 = \frac{30}{100}$	(E)	(F)
$0.3 = \frac{3}{10}$	(G)	(H)

6 Write two fractions equivalent to 0.4.

7 Which words or fractions name the same number as 0.62?

- (A) sixty-two hundredths
- (B) six and two hundredths
- (C) six tenths and two hundredths
- (D) $\frac{62}{10}$
- (E) $\frac{62}{100}$

8 The number line below shows 1 whole divided into tenths. Write numbers in the boxes to label the missing fractions and decimal. Explain how you know what numbers to write.



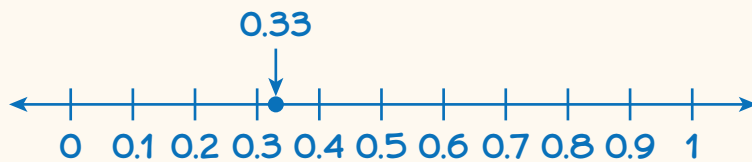
Refine Relating Decimals and Fractions

Complete the Example below. Then solve problems 1–8.

EXAMPLE

The length of a ribbon is 0.33 of a meter. How can you locate 0.33 on a number line?

Look at how you could show your work using a number line.



$$0.33 = \frac{33}{100}$$

Solution

.....

The student used a number line with tenths marks and placed 0.33 between 0.3 and 0.4.



PAIR/SHARE

How many hundredths are there between each of the tenths marks on the number line?

APPLY IT

1 What is 0.7 written as a fraction? Show your work.

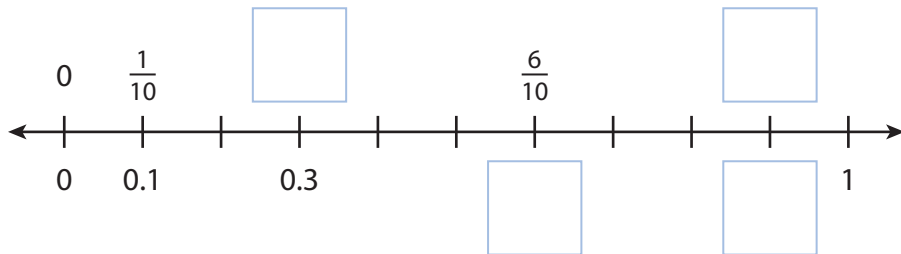
How could drawing a model help you?

Solution

PAIR/SHARE

How do you know if the decimal represents tenths or hundredths?

- 2 The number line below shows 1 whole divided into tenths. Write numbers in the boxes to label the missing fractions and decimals. Explain how you know what numbers to write.



Could saying each number aloud help?



PAIR/SHARE

How could you show hundredths on this number line?

- 3 Which decimal names the same amount as $\frac{50}{100}$?

- (A) 0.50
- (B) 0.05
- (C) 50.0
- (D) 50.10

Abby chose (B) as the correct answer. How did she get that answer?

What does the denominator of the fraction tell you?

PAIR/SHARE

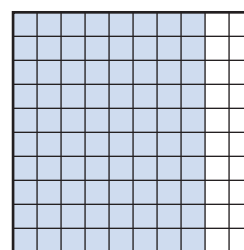
What is a decimal in tenths that is equivalent to $\frac{50}{100}$?

- 4 What is 0.75 written as a fraction?
- (A) $\frac{.75}{100}$
- (B) $\frac{0}{75}$
- (C) $\frac{75}{100}$
- (D) $\frac{75}{10}$
- 5 Which fractions and decimals are equivalent?
- (A) $\frac{4}{10}$ and 0.04
- (B) $\frac{6}{100}$ and 0.60
- (C) $\frac{3}{10}$ and 0.3
- (D) $\frac{9}{100}$ and 0.09
- (E) $\frac{7}{10}$ and 7.10

- 6 Model A is shaded to represent a value that is less than 1 whole.

Tell whether each fraction or decimal correctly represents the shaded part of Model A.

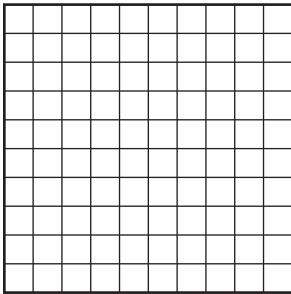
	Yes	No
$\frac{8}{10}$	(A)	(B)
$\frac{80}{100}$	(C)	(D)
0.08	(E)	(F)



Model A



- 7 A test has 100 questions. Cora gets 85 questions correct. What decimal shows the part of the test she gets correct? What decimal shows the part of the test she gets incorrect? Model the decimals below. Show your work.




Solution

8 MATH JOURNAL

Show how to plot $\frac{4}{10}$, 0.8, $\frac{2}{10}$, and 0.4 on the number line below. Explain how you know your answer is correct.



 **SELF CHECK** Go back to the Unit 4 Opener and see what you can check off.