

# Compare Decimals

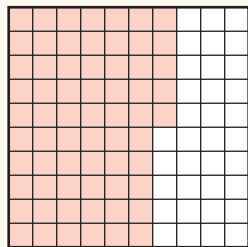


Dear Family,

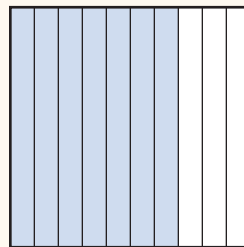
This week your child is learning to compare decimals.

A model can help your child compare decimals when one decimal is in tenths and the other decimal is in hundredths.

The models show 0.65 and 0.7.



**0.65**  
**sixty-five hundredths**



**0.7**  
**seven tenths**

A greater area is shaded for 0.7 than for 0.65, so 0.7 is greater than 0.65.

Your child can also use a place-value chart to compare decimals in tenths and hundredths.

7 tenths equals 70 hundredths.  $\frac{7}{10} = \frac{70}{100}$

| Ones | . | Tenths | Hundredths |
|------|---|--------|------------|
| 0    | . | 6      | 5          |
| 0    | . | 7      | 0          |

The place-value chart shows that seventy hundredths, or seven tenths, is greater than sixty-five hundredths. Compare the digits in the tenths place:  $7 > 6$ .

$$0.70 > 0.65 \text{ and } 0.7 > 0.65$$

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

## ACTIVITY **COMPARING DECIMALS**

Do this activity with your child to compare decimals.

**Materials** fliers for grocery, drug, or hardware stores (optional)

- Look for items around the house or look through the fliers to find at least six decimal numbers. Make a list of the numbers as you find them; do not include the units that are shown with the numbers.

*Example:* You have a box of crackers that is 6.75 ounces.

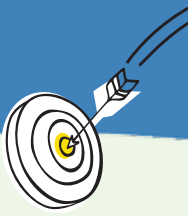
Write the decimal 6.75 on your list.

- Take turns. One person marks two decimal numbers for the other person to compare. Make and use place-value charts, if needed.
- Challenge! Of all the decimal numbers you have compared, can you tell which is the greatest of all? Talk about how you know.

Look for other real-life opportunities to compare decimals with your child.



# Explore Comparing Decimals



## Learning Target

- Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols  $>$ ,  $=$ , or  $<$ , and justify the conclusions, e.g., by using a visual model.

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

You know how to compare whole numbers and fractions. In this lesson, you will compare decimals. Use what you know to try to solve the problem below.

**Kele and Kaci each buy equal-sized bottles of water. They each drink some of their water. Kele now has 0.5 of his bottle left. Kaci has 0.4 of her bottle left. Who has more water left?**

## TRY IT



## Math Toolkit

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



## DISCUSS IT

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

**Tell your partner:** I disagree with this part because . . .



## CONNECT IT

### 1 LOOK BACK

Does Kele or Kaci have more water left? Explain how you know.

### 2 LOOK AHEAD

You compare the decimals 0.5 and 0.4 to decide who has more water left.

- a. Suppose you have two more same-sized bottles of water. One bottle is 0.8 full of water, and the other bottle is 0.9 full of water.

Compare the decimals 0.8 and 0.9 to tell which bottle has more water. Write both decimals in the place-value chart.

| Ones | . | Tenths |
|------|---|--------|
|      |   |        |
|      |   |        |

- b. Compare the places from left to right, just as you do with whole numbers. Write  $>$ ,  $<$ , or  $=$  to compare.

$$9 \bigcirc 8, \text{ so } 0.9 \bigcirc 0.8.$$

- c. Which has more water, the bottle that is 0.8 full of water or the bottle that is 0.9 full of water?

### 3 REFLECT

Suppose the water bottles were different sizes. Could you compare the bottle that is 0.8 full and the bottle that is 0.9 full in the same way as in problem 2? Explain.

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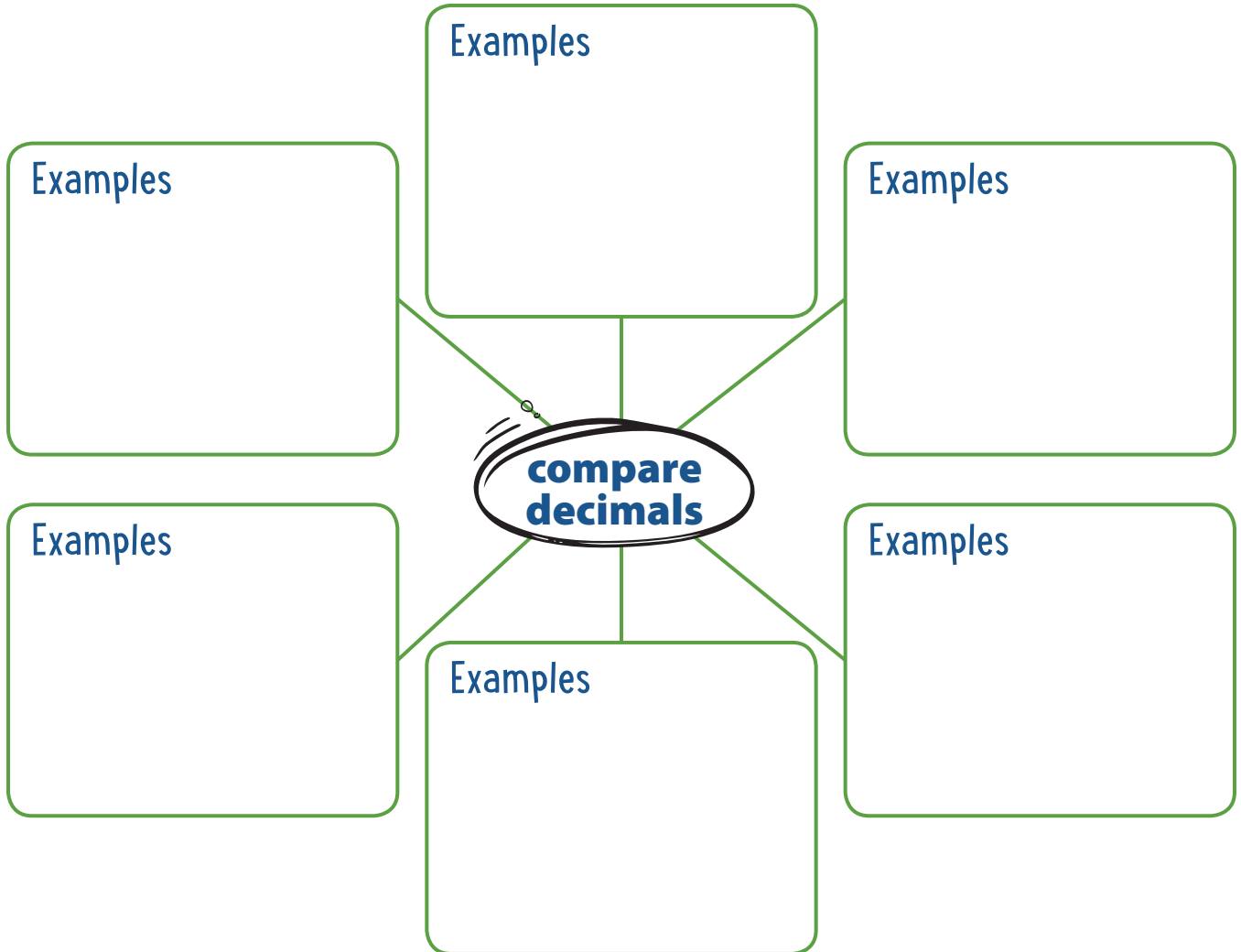
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# Prepare for Comparing Decimals

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



- 2 Compare the decimals 0.4 and 0.5. Write both decimals in the place-value chart. Then write  $>$ ,  $<$ , or  $=$  to compare.

4  5, so 0.4  0.5.

| Ones | . | Tenths |
|------|---|--------|
|      |   |        |
|      |   |        |

- 3 Solve the problem. Show your work.

**Rafael and Zina each buy equal-sized granola bars. They each eat some of their granola bar. Rafael now has 0.6 of his granola bar left. Zina has 0.7 of her granola bar left. Who has more of their granola bar left?**



**Solution** .....

- 4 Check your answer. Show your work.

# Develop Comparing Decimals in Hundredths

Read and try to solve the problem below.

Dora lives 0.35 of a mile from school. Katrina lives 0.53 of a mile from school. Who lives a greater distance from school?

## TRY IT



### Math Toolkit

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



## DISCUSS IT

**Ask your partner:** How did you get started?

**Tell your partner:** I started by ...

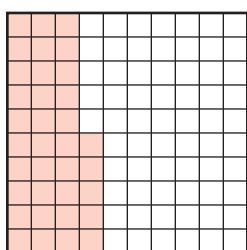
Explore different ways to understand how to compare two decimals when both are in hundredths.

**Dora lives 0.35 of a mile from school. Katrina lives 0.53 of a mile from school. Who lives a greater distance from school?**

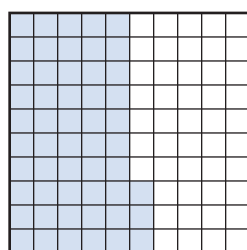
### MODEL IT

You can use a model to help compare decimals in hundredths.

Each large square is one whole. The shaded areas show 0.35 and 0.53.



0.35



0.53

0.35 is thirty-five hundredths. 0.53 is fifty-three hundredths.

### MODEL IT

You can also use a place-value chart to help compare decimals in hundredths.

The place-value chart shows 0.35 and 0.53.

| Ones | . | Tenths | Hundredths |
|------|---|--------|------------|
| 0    | . | 3      | 5          |
| 0    | . | 5      | 3          |

Compare ones: The digits are the same.

Compare tenths:  $5 > 3$ .

Since the tenths digits are different, you do not need to compare hundredths digits.



## CONNECT IT

Now you will use the problem from the previous page to help you understand how to compare two decimals when both are in hundredths.

- 1 Look at the models on the previous page.

Write a fraction equivalent to 0.35: .....; to 0.53: .....

- 2 Which fraction is greater? Explain how you know.

- 3 Write  $>$ ,  $<$ , or  $=$  in the circle to make a true statement:  $0.35 \bigcirc 0.53$ .

Who lives a greater distance from school? .....

Do the model and place-value chart support your answer? Explain.

- 4 Explain how you can use fractions to compare two decimals when both are in hundredths.

## 5 REFLECT

Look back at your **Try It**, strategies by classmates, and **Model Its**. Which models or strategies do you like best for comparing two decimals when both are in hundredths? Explain.

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**APPLY IT**

Use what you just learned to solve these problems.

- 6 Compare 4.21 and 4.12 using  $>$ ,  $<$ , or  $=$ . Explain how you got your answer. Show your work.

**Solution** .....

.....

.....

- 7 Kord writes a decimal number that is greater than 0.39 but less than 0.44. What number could Kord have written? Show your work.

**Solution** .....

- 8 Which is less: 0.97 or 0.79? Show your work.

**Solution** .....

# Practice Comparing Decimals in Hundredths

Study the Example showing how to compare decimals to solve a word problem when both decimals are in hundredths. Then solve problems 1–5.

## EXAMPLE

Jacob buys an apple and a pear. The apple weighs 0.33 of a pound. The pear weighs 0.35 of a pound. Which piece of fruit weighs less?

Write equivalent fractions.  
The denominators are the same.  
Compare the numerators:  $33 < 35$ .

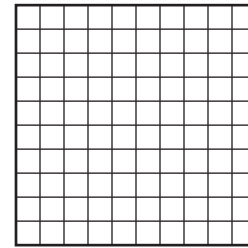
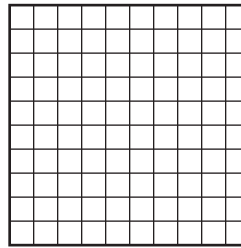
So,  $0.33 < 0.35$ .  
The apple weighs less than the pear.

$$0.33 = \frac{33}{100} \quad 0.35 = \frac{35}{100}$$

same denominator



- 1 Shade and label the models to show 0.33 and 0.35. Then explain how the models show which decimal is less.



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.....

- 2 Complete the place-value chart to show 0.33 and 0.35. Then explain how the chart shows which decimal is less.

| Ones | . | Tenths | Hundredths |
|------|---|--------|------------|
|      | . |        |            |
|      | . |        |            |

- 3 Use the digits in the tiles below to write decimals that make each statement true. You may use a digit more than once.



a.  $0.21 > 0.2\boxed{\phantom{0}}$

b.  $0.46 < 0.\boxed{\phantom{0}}6$

c.  $0.99 < \boxed{\phantom{0}}.00$

d.  $0.7\boxed{\phantom{0}} > 0.7\boxed{\phantom{0}}$

- 4 Write the symbol ( $>$ ,  $<$ ,  $=$ ) that makes each statement below true.

a.  $0.85 \bigcirc 0.82$

b.  $0.09 \bigcirc 0.10$

c.  $0.45 \bigcirc 0.54$

d.  $1.10 \bigcirc 1.01$

e.  $0.30 \bigcirc 0.3$

- 5 Ryder buys 0.75 of a pound of turkey and 0.57 of a pound of cheese. Does he buy more turkey or more cheese? Show your work.



**Solution** .....

# Develop Comparing Decimals in Tenths and in Hundredths

Read and try to solve the problem below.





**Matt measures two insects. The bumblebee is 0.75 of an inch long. The hornet is 0.8 of an inch long. Which insect is longer?**

## 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:** A model I used was . . . It helped me . . .

Explore different ways to understand how to compare decimals in tenths and hundredths.

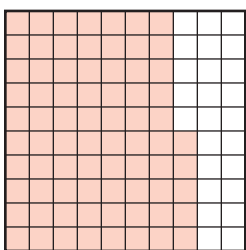
**Matt measures two insects. The bumblebee is 0.75 of an inch long. The hornet is 0.8 of an inch long. Which insect is longer?**



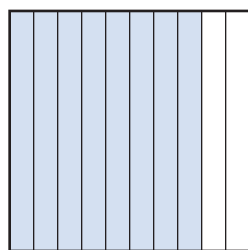
## MODEL IT

You can use a model to help compare decimals in tenths and hundredths.

Each large square is one whole. The models show 0.75 and 0.8.



0.75



0.8

## MODEL IT

You can also use a place-value chart to compare decimals in tenths and hundredths.

Notice that 0.8 has a 0 in the hundredths place in the chart. Remember that 8 tenths is equivalent to 80 hundredths.

| Ones | . | Tenths | Hundredths |
|------|---|--------|------------|
| 0    | . | 7      | 5          |
| 0    | . | 8      | 0          |

Compare ones: The digits are the same.

Compare tenths:  $8 > 7$ .

Since the tenths digits are different, you do not have to compare hundredths.

## CONNECT IT

Now you will use the problem from the previous page to help you understand how to compare decimals in tenths and hundredths.

- 1 Write fractions equivalent to 0.75 and 0.8.
- 2 How can you compare fractions with denominators of 100 and 10?
- 3 What fraction with a denominator of 100 is equivalent to  $\frac{8}{10}$ ? .....
- 4 Compare the fractions. Then compare 0.75 and 0.8 using  $>$ ,  $<$ , or  $=$ .

Which insect is longer? .....

- 5 Explain how you can compare decimals when one is in tenths and the other is in hundredths.

## 6 REFLECT

Look back at your **Try It**, strategies by classmates, and **Model Its**. Which models or strategies do you like best for comparing two decimals when one is in tenths and the other is in hundredths? Explain.

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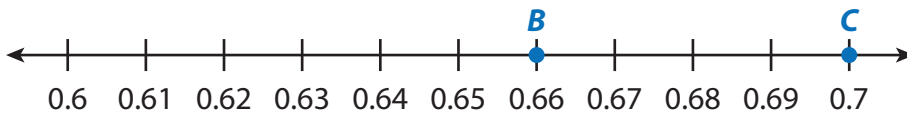
## APPLY IT

Use what you just learned to solve these problems.

- 7 Which is greater: 0.9 or 0.92? Show how you can use fractions to solve the problem. Show your work.

*Solution* .....

- 8 The locations of points *B* and *C* on the number line represent decimal numbers. Explain why the value of point *C* is greater than the value of point *B*.



*Solution* .....

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.....

- 9 Compare 0.37 and 0.4 using  $>$ ,  $<$ , or  $=$ . Explain how you got your answer. Show your work.

*Solution* .....

.....

.....



## Practice Comparing Decimals in Tenths and in Hundredths

Study the Example showing how to compare decimals in tenths and hundredths. Then solve problems 1–6.

### EXAMPLE

Colin lives 0.6 of a mile from school and 0.65 of a mile from the park.  
Which place is closer to his home?

Write each decimal as an equivalent fraction.

$$0.6 = \frac{6}{10} \quad 0.65 = \frac{65}{100}$$

Write the tenths fraction as a hundredths fraction.

$$\frac{6}{10} = \frac{60}{100}$$

Compare hundredths fractions.

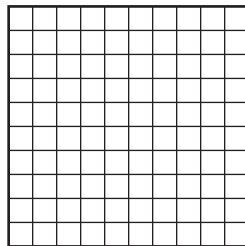
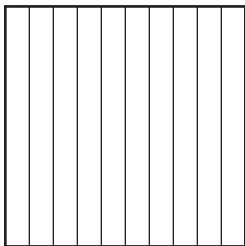
$$\frac{60}{100} < \frac{65}{100}$$

$$0.6 < 0.65$$

The school is closer to his home.

**Lucas buys 0.6 of a pound of fish and 0.85 of a pound of shrimp to make a stew.**

- 1 Shade the models below to compare 0.6 and 0.85.



- 2 Write a symbol to compare the decimals. 0.6  0.85
- 3 Does Lucas buy more fish or more shrimp? Use equivalent fractions to explain your answer.

- 4 Compare 0.2 and 0.25 using  $>$ ,  $<$ , or  $=$ . Use equivalent fractions to explain your answer.

**Solution** .....

.....

- 5 Compare 0.09 and 0.1 using  $>$ ,  $<$ , or  $=$ . Use a place-value chart to explain your answer.

| Ones | . | Tenths | Hundredths |
|------|---|--------|------------|
|      | . |        |            |
|      | . |        |            |

**Solution** .....

.....

.....

- 6 Write the decimals 1.00, 0.20, and 0.03 in the place-value chart below. Which number is the greatest? Which number is the least? Use equivalent fractions to explain.

| Ones | . | Tenths | Hundredths |
|------|---|--------|------------|
|      | . |        |            |
|      | . |        |            |
|      | . |        |            |

**Solution** .....

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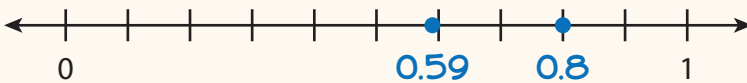
# Refine Comparing Decimals

Complete the Example below. Then solve problems 1–9.

## EXAMPLE

Show the numbers 0.59 and 0.8 in their correct locations on the number line. Then write  $>$ ,  $<$ , or  $=$  to compare the numbers.

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



0.59 is less than 0.8, and 0.8 is greater than 0.59.

**Solution** .....

The student placed 0.59 on the number line between the tenths marks for 0.5 and 0.6 but closer to 0.6.



## PAIR/SHARE

What does its position on a number line tell you about the value of a number?

## APPLY IT

- 1 Compare 0.3 and 0.8 using  $>$ ,  $<$ , or  $=$ . Draw a model or number line to support your solution. Show your work.

What models can you use to support your solution?

**Solution** .....

## PAIR/SHARE

Compare the models that you and your partner used.

- 2 Mika runs the 50-yard dash in 7.39 seconds. Felix runs it in 7.6 seconds. Who runs faster? Show your work.

Does the greater number mean a faster or slower time?



**PAIR/SHARE**

How did you and your partner decide what method to use to solve the problem?

**Solution** .....

- 3 Which statement and reasoning is true about the decimals 0.45 and 0.5?
- (A)  $0.45 < 0.5$  because hundredths are greater than tenths.
  - (B)  $0.45 < 0.5$  because  $\frac{45}{100} < \frac{50}{100}$ .
  - (C)  $0.45 > 0.5$  because  $45 > 5$ .
  - (D)  $0.45 > 0.5$  because hundredths are greater than tenths.

Sarah chose (C) as the correct answer. How did she get that answer?

Make sure that the reasoning makes sense, too—not just the comparison.

**PAIR/SHARE**

Explain how you chose your answer.

- 4 Which change would make the following a true statement?

$$0.5 < 0.43$$

- (A) Put a 3 in the hundredths place to change 0.5 to 0.53.
- (B) Change the hundredths digit in 0.43 to 0.
- (C) Put a 0 in the tenths place to change 0.5 to 0.05.
- (D) Put a 0 in the hundredths place to change 0.5 to 0.50.

- 5 Which decimal is less than 3.75?

- (A) 3.9
- (B) 3.94
- (C) 3.80
- (D) 3.7

- 6 Tell whether each statement is *True* or *False*.

|                                                                          | True | False |
|--------------------------------------------------------------------------|------|-------|
| $0.5 < 0.6$ because $\frac{5}{10}$ is less than $\frac{6}{10}$ .         | (A)  | (B)   |
| $0.25 > 0.3$ because 25 is greater than 3.                               | (C)  | (D)   |
| $0.89 > 0.8$ because $\frac{89}{100}$ is greater than $\frac{80}{100}$ . | (E)  | (F)   |
| $0.06 = 0.6$ because 6 equals 6.                                         | (G)  | (H)   |
| $0.4 < 0.14$ because 4 is less than 14.                                  | (I)  | (J)   |

- 7 Which decimals are greater than 0.07 but less than 0.3?
- Ⓐ 0.02
  - Ⓑ 0.34
  - Ⓒ 0.27
  - Ⓓ 0.73
  - Ⓔ 0.1
- 8 Jana writes two numbers that are between 0.4 and 0.45 on the board. What numbers could Jana write?

**Solution** .....

### 9 MATH JOURNAL

Troy says that  $0.9 > 0.90$  because tenths are greater than hundredths. Keith says that  $0.9 < 0.90$  because 90 is greater than 9. Is either Troy or Keith correct? How would you compare 0.9 and 0.90? Explain.



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