Ordering Decimals

BEFORE	Now	WHY?
You compared and ordered whole numbers.	You'll compare and order decimals.	So you can order data such as ages of volcanoes in Ex. 25.

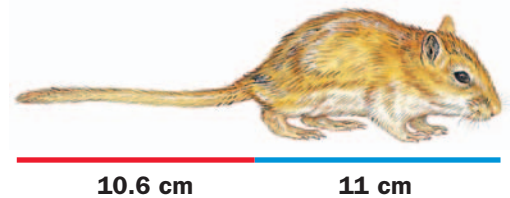## In the Real World

Word Watch

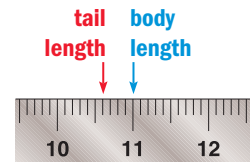**Review Words**
number line, p. 685

Gerbils A Mongolian gerbil's tail is about the same length as its body. A gerbil has a body length of 11 centimeters and a tail length of 10.6 centimeters. Which is longer, the body or the tail?

10.6 cm   11 cm

EXAMPLE 1   Comparing Metric Lengths

To answer the real-world question above, use a metric ruler. The tail length, 10.6 centimeters, is to the left of the body length, 11 centimeters.

You can say: $10.6 < 11$ or $11 > 10.6$

is less than   *is greater than*

HELP with **Reading**

Less than and *greater than* symbols always point to the lesser number.

tail length   body length

10   11   12

ANSWER The gerbil's body is longer than its tail.

EXAMPLE 2   Ordering Decimals on a Number Line

Order the numbers from least to greatest: 3.1, 3.28, 3.06, 3, 3.15.

Graph each number on a number line. Begin by marking tenths from 3.0 to 3.3. Then mark hundredths by dividing each tenth into ten sections.

The numbers on a number line increase from left to right.

3   3.06   3.1   3.15   3.28
3.0   3.1   3.2   3.3
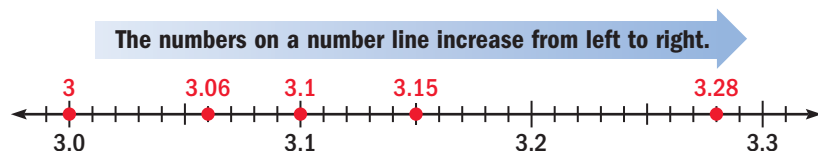
ANSWER An ordered list of the numbers is 3, 3.06, 3.1, 3.15, and 3.28.

Your turn now   Use the number line in Example 2.

1. Order the numbers from least to greatest: 3.2, 3.29, 3.04, and 3.17.

2. Write three numbers that are greater than 3.2 and less than 3.25.

Comparing Decimals When you graph decimals on a number line to compare them, the greater number is farther to the right. You can also compare decimals by looking at their place values.
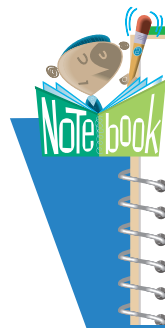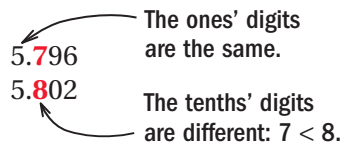
Steps for Comparing Decimals

1. Write the decimals in a column, lining up the decimal points.

2. If necessary, write zeros to the right of the decimals so that all decimals have the same number of decimal places.

3. Compare place values from left to right.
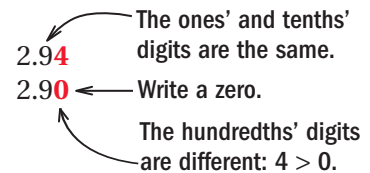

EXAMPLE 3 **Comparing Decimals**

Copy and complete the statement with <, >, or =.

a. 5.796 ? 5.802

5.**7**96 — The ones' digits are the same.

5.**8**02 — The tenths' digits are different: 7 < 8.

ANSWER 5.796 < 5.802

b. 2.94 ? 2.9

2.9**4** — The ones' and tenths' digits are the same.

2.9**0** ← Write a zero.

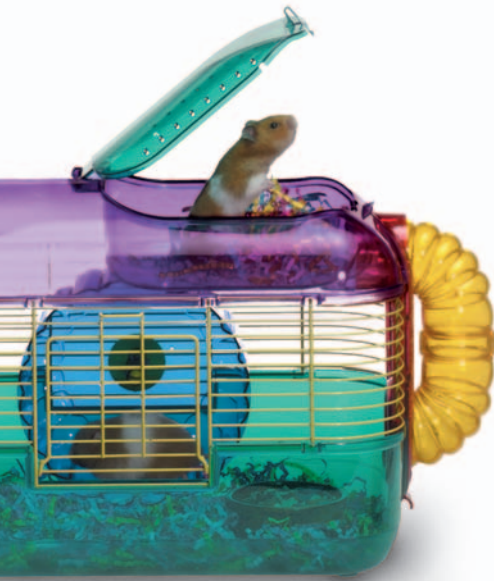The hundredths' digits are different: 4 > 0.

ANSWER 2.94 > 2.9

EXAMPLE 4 **Ordering Decimals**

Order the gerbils from heaviest to lightest.

The digits are the same through the tenths' place. Compare hundredths, then thousandths if necessary: 77.0**25**0, 77.0**21**2, 77.0**1**13, and 77.0**0**33.

ANSWER The gerbils, from heaviest to lightest, are Scruff, Fluff, Edgar, and Scamp.

Gerbil	Weight (grams)
Edgar	77.0113
Fluff	77.0212
Scamp	77.0033
Scruff	77.0250

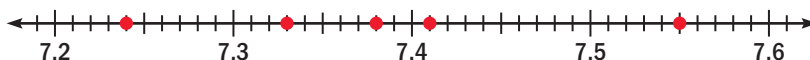**Your turn now** **Copy and complete the statement with <, >, or =.**

3. 7.54 ? 7.45

4. 8.5 ? 8.50

5. 0.409 ? 0.411

Getting Ready to Practice

Vocabulary Copy and complete the statement using a decimal that is graphed in red on the number line.

1. 7.41 is less than ?.

2. 7.33 is greater than ?.

3. ? is between 7.33 and 7.41.

4. 7.41 is between 7.33 and ?.

5. Telephone Calls Order the following list of telephone call costs from least to greatest: $3.70, $3.29, $3.07, $3.92, $2.79, and $3.79.

Practice and Problem Solving

Copy and complete the statement with <, >, or =.

6. 2.8 ? 2.6

7. 7.1 ? 6.9

8. 8.5 ? 9.4

9. 1.21 ? 1.12

10. 4.82 ? 4.94

11. 9.50 ? 9.05

12. 8.7 ? 8.70

13. 4.40 ? 4.4

14. 42.1 ? 4.21

15. Explain Will a book that is 27.36 centimeters tall stand upright in a bookcase whose shelves are 27.4 centimeters apart? Explain.

Order the numbers from least to greatest.

16. 5.34, 5.12, 5.43

17. 9.07, 9.06, 9.1

18. 4.3, 4.25, 4.31

19. 0.9, 1.1, 0.1, 1.5

20. 7.4, 7.9, 7, 6.9

21. 1.2, 1.05, 1.15, 0.98

22. 2.94, 2.904, 2.844, 2.899, 2.894

23. 0.055, 0.555, 0.55, 0.065, 0.56

24. Milk Prices The average cost of a gallon of milk in various cities is given below. Order the costs from least to greatest.

| Los Angeles | Rio De Janeiro | London | Paris | Hong Kong | Sydney |
| $3.07 | $2.61 | $2.08 | $2.84 | $8.40 | $2.62 |

■ Volcanoes

Lanai is another Hawaiian volcano. It is 1.28 million years old. How does the age of Lanai compare with the ages of the other volcanoes in Exercise 25?

25. Volcanoes The table shows the ages, in millions of years, of four Hawaiian volcanoes. Order the volcanoes from youngest to oldest.

Hawaiian Volcano Ages (millions of years)				
Volcano	Mauna Kea	West Maui	West Molokai	Haleakala
Age	0.375	1.32	1.9	0.75

26. Critical Thinking If the price of every item in a store goes up by the same amount, does the order of least expensive item to most expensive item change? Why or why not?

xy **Algebra** **Find a value of *n* that makes the statement true.**

27. $8.3 < n$ and $n < 9$ **28.** $0.5 < n$ and $n < 1$ **29.** $3.6 < n$ and $n < 3.7$

Challenge **In Exercise 30, use only the digits 0 and 1.**

30. Write all the different decimals of the form ? . ? ? .

31. Order the decimals you wrote in Exercise 30 from least to greatest.

Mixed Review

32. The heights, in feet, of newly planted trees are given below. Find the mean, median, mode, and range of the data. *(Lesson 2.8)*
   4, 5, 7, 5, 3, 4, 6, 5, 4, 5, 6, 4, 7

33. Write the number *twenty-eight and sixteen ten-thousandths* as a decimal. *(Lesson 3.1)*

Basic Skills **Round the number to the place value of the red digit.**

34. 2**7**13 **35.** 10**6**,503 **36.** 1,**9**70,241

Test-Taking Practice

37. Multiple Choice Order the decimals from least to greatest: 0.3454, 0.4345, 0.3354, and 0.3345.

A. 0.4345, 0.3454, 0.3354, 0.3345 **B.** 0.3354, 0.3345, 0.4345, 0.3454

C. 0.3345, 0.3354, 0.3454, 0.4345 **D.** 0.3354, 0.3454, 0.3345, 0.4345

38. Multiple Choice In a competition, four of the participants have completed their performances. Their scores are 9.61, 9.66, 9.64, and 9.60. The highest score wins. Which score will enable the last participant to win the competition?

F. 9.67 **G.** 9.65 **H.** 9.62 **I.** 9.06

Notebook Review

Review the vocabulary definitions in your notebook.

Copy the review examples in your notebook. Then complete the exercises.

Check Your Definitions

decimal, p. 108   centimeter (cm), p. 56   number line, p. 685
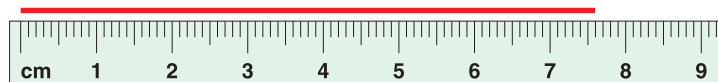millimeter (mm), p. 56   meter (m), p. 56

Use Your Vocabulary

1. Copy and complete: The decimal 2.06 is read "two and six ? ."

2. **Writing** Explain the role of the decimal point in a decimal.

3.1–3.2 Can you measure and write decimal lengths?

Review

EXAMPLE Write the length of the line segment as a decimal number of centimeters.

cm 1   2   3   4   5   6   7   8   9

ANSWER The length is 7.6 centimeters.

✓ **Write the length in words and as a decimal.**

3. Find the length of this sentence to the nearest tenth of a centimeter.

4. Find the height of this book to the nearest hundredth of a meter.

3.3 Can you compare and order decimals?

Review

EXAMPLE Which is greater, 8.4 or 8.42?

8.4**0**
8.4**2**

> The first two digits are the same.
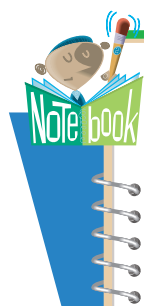> The hundredths' digits are different: 2 > 0.

ANSWER 8.42 > 8.4

✓ **Copy and complete the statement with <, >, or =.**

5. 6.54 _?_ 6.45   **6.** 2.536 _?_ 2.541   **7.** 9.7 _?_ 9.70

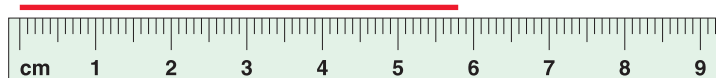**8.** Order the numbers from least to greatest: 0.91, 0.94, 0.09, 0.082, 0.75.

NOTEbook

Stop and Think about Lessons 3.1–3.3

9. Writing Explain the difference between *five hundred ten-thousandths* and *five hundred ten thousandths*.

10. Critical Thinking Explain why 0.50 is equal to 0.5.

Review Quiz 1

Write the decimal in words.

1. 6.52   **2.** 17.017   **3.** 0.1234

4. Write the number *eight and seven hundred fifty-two thousandths* as a decimal.

5. Find the length of the line segment to the nearest tenth of a centimeter.

6. Order the numbers from least to greatest: 11.21, 11.02, 11.20, 11, 11.041.

Copy and complete the statement with <, >, or =.

7. 5.02 _?_ 5.21   **8.** 24.632 _?_ 24.236   **9.** 38.9 _?_ 38.90

10. Body Temperature If normal body temperature is about 98.6°F, is a temperature of 98.06°F *above* or *below* normal?

BrAIN GAME

What Number Am I?

I have two digits to the left of my decimal point and two digits to the right of my decimal point. My hundredths' digit is two times my tenths' digit. When 1 is subtracted from my tens' digit, the answer is 5. I have a 2 as my tenths' digit. My ones' digit is greater than 0 and less than my tenths' digit. What number am I?

? ? . ? ?