TABLE OF CONTENTS

Objective

To compare decimals by using place value

1 Introduction

Briefly review comparing whole numbers; students should recall that digits in the same places should be compared. Extend the discussion to decimal numbers, stressing that they are compared in the same way as whole numbers. Then work through the examples on the page. Discuss the use of models, such as number lines or grids, to visually compare the decimals.

Think About It

Students should recognize that they can add a placeholder zero to give the decimals being compared the same number of places. For example, 0.1 becomes 0.10 and then is easier to compare to 0.15. Since 5 is greater than 0, 0.15 is greater than 0.1.

Common Core State Standard

4.NF.7 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.

② Focused Instruction

First, students compare two decimals with the same number of places. They align the numbers on the decimal points, identify the places, and compare the digits in those places to determine which number is greater. They then write a comparison using the symbol <.

Next, students compare two decimals with different numbers of places. They model each number on a grid, converting the number in tenths to hundredths, and compare the models.

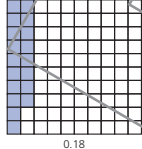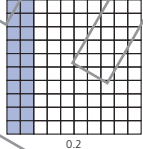Finally, students locate three decimals on a number line to order them from least to greatest.

Conclude the Focused Instruction section by having students answer two questions involving comparing and ordering decimals.

③ Guided Practice

Students should complete the Guided Practice section on their own. Offer assistance as needed, pointing out the reminder and hint boxes along the right side of the page.

---

② Focused Instruction — Lesson 29

How many hundredths are equal to 0.2? **20**

Shade the left grid to model the number of hundredths in 0.18. Shade the right grid to model the number of hundredths in 0.2.
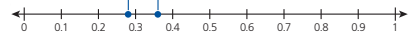
0.18   0.2

Which grid has a greater amount shaded? **0.2**

Write a comparison using a <, >, or = symbol. **0.18 < 0.2**

Use a number line to compare and order decimals.

▶ List the decimals 0.82, 0.53, and 0.69 in order from least to greatest.

Mark each decimal with a point on the number line below. Label the points.

0.53   0.69   0.82
0   0.1   0.2   0.3   0.4   0.5   0.6   0.7   0.8   0.9   1

Are numbers on the left larger or smaller than numbers on the right? **smaller**

Write the numbers in order from least to greatest. **0.53, 0.69, 0.82**

Use what you know about comparing decimals to answer these questions.

1 Complete each comparison with the correct symbol, >, <, or =.

0.37 **>** 0.29   0.48 **<** 0.5   0.6 **=** 0.60

2 Write the decimals 0.29, 0.3, and 0.18 in order from greatest to least.
0.3, 0.29, 0.18

---

③ Guided Practice — Lesson 29

Solve the following problems.

1 Sachiko lives 0.36 mile from Olga and 0.28 mile from Livia.

The greater number is always on the right on a number line.

Part A Draw and label a point on the number line for each decimal.

0.28 0.36
0   0.1   0.2   0.3   0.4   0.5   0.6   0.7   0.8   0.9   1

Part B Write a comparison statement to compare the decimals.

Answer **0.36 > 0.28 or 0.28 < 0.36**

Use the symbol >, <, or = to compare the numbers.

Part C Which friend lives farthest from Sachiko?

Answer **Olga**

2 The chart shows the weights of three packages, in kilograms.

Package	Weight (kilograms)
A	0.78
B	0.09
C	0.8

Write 0.8 as an equivalent decimal in hundredths. Then compare.

Part A Write the weights in order from least to greatest.

Answer **0.09, 0.78, 0.8**

Part B Explain how you found your answer.

I rewrote 0.8 as 0.80. Then I compared the digits in the tenths place. 8 is greater than 7 and 0, so 0.8 is the greatest number. Then 7 is greater than 0, so 0.78 is the next greatest number and 0.09 is the smallest number.

Independent Practice

Solve the following problems.

1 Astrid marked two decimals on this number line. Then she wrote a true comparison using the decimals she marked.

(number line 0 to 1 with marks at tenths)
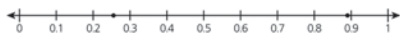
DOK 2
4.NF.7

Which comparison could be the one Astrid wrote?

A 0.2 > 0.8

B 0.35 > 0.91

C 0.36 < 0.88

D 0.26 < 0.89 *(circled)*

2 Mark True or False for each comparison.

DOK 2
4.NF.7

	True	False
0.29 > 0.31	☐	☑
0.09 < 0.10	☑	☐
0.82 > 0.90	☐	☑
0.2 = 0.02	☐	☑
0.30 < 0.33	☑	☐
0.7 = 0.70	☑	☐

210 UNIT 4 Number and Operations—Fractions
© The Continental Press, Inc. DUPLICATING THIS MATERIAL IS ILLEGAL.

Independent Practice

3 A centimeter (cm) is 0.01 meter. A decimeter (dm) is 0.10 meter.

DOK 2
4.NF.7

Part A Mark and label 5 dm and 35 cm on the meter stick below.

(meter stick marked 0 to 100 cm, with 35 cm and 5 dm labeled)
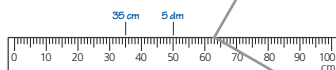
Part B Which measurement is greater?

Answer ___5 dm___

4 Sanjay and Neela each had a bag of candy holding 100 pieces. Sanjay's bag weighed 4 pounds and held 100 chocolate bars. Neela's bag weighed 1 pound and held 100 jellybeans. Sanjay ate 0.50 of the candy in his bag. Neela ate 0.75 of the candy in her bag.

DOK 3
4.NF.7

Neela made the grids to show that she ate a greater amount of candy.

(two 100-square grids labeled Sanjay and Neela)
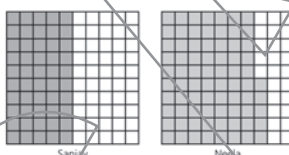
Explain the mistake that Neela made.

Neela did not compare the decimals to the same whole.
Sanjay's whole is 4 pounds and her whole is only 1 pound.

UNIT 4 Number and Operations—Fractions **211**
© The Continental Press, Inc. DUPLICATING THIS MATERIAL IS ILLEGAL.

Independent Practice Answer Rationales

1 Estimate the values of the points by their approximate distances from the tenths marks. The point on the left is about halfway between 0.2 and 0.3; the point on the right is between 0.8 and 0.9, but closer to 0.9. Choice A is incorrect because the points are not directly on either 0.2 or 0.8. Choice B is incorrect; 0.35 is too great to be the leftmost point and the comparison also uses the incorrect symbol. Choice C is incorrect; the statement uses the correct symbol and 0.88 could be the rightmost point, but 0.36 is too far to the right for the indicated point. Choice D is correct; the comparison names plausible values for the points and uses the correct symbol, <, to compare them.

2 The first comparison is false; 2 tenths is less than, not greater than, 3 tenths. The second comparison is true; comparing the tenths, 0 is less than 1. The third comparison is false; 8 tenths is less than, not greater than, 9 tenths. The fourth comparison is false; the 2s occupy different places, and 2 tenths is greater than, not equal to, 2 hundredths. The fifth comparison is true; the digits in the tenths places are the same, but in the hundredths places, the 3 is greater than the 0. The sixth comparison is true; the 7 occupies the tenths place in both numbers, and the 0 in the hundredths does not change the value because 7 tenths is equivalent to 70 hundredths.

3 **PARTS A AND B** A centimeter is 0.01 meter, or 1 hundredth of a meter. So 35 centimeters equal 0.35 meter. A decimeter is 0.1 meter, or 1 tenth of a meter. So 5 decimeters equal 0.50 meter. The meter stick is marked with centimeters and every tenth mark is labeled and is equal to 1 decimeter. So 35 centimeters goes between 30 and 40 and 5 decimeters goes on the 50 centimeter mark. Since 50 centimeters is greater than 35 centimeters, 5 decimeters is the greater measurement.

4 Like fractions, decimals can only be compared if they refer to the same whole. Although each person has a whole with 100 equal parts, Sanjay's bag is 4 pounds, and Neela's bag is 1 pound. So a hundredth of Sanjay's bag will be greater than a hundredth of Neela's bag.

5 PART A Each grid shows hundredths, and the weights are given in hundredths of a ton. On the first grid, show 0.57 ton by shading 57 squares. On the second grid, represent 0.65 ton by shading 65 squares. On the third grid, show 0.09 ton by shading 9 squares. The decimals can be compared because they are all parts of a whole made up of 100 parts.
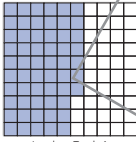
PARTS B AND C The tenths place determines the size of these decimals and 0 tenths is less than 5 tenths is less than 6 tenths. Chuck's mistake was reading 0.09 as 9 tenths, rather than 9 hundredths. In order, the numbers are 0.09 < 0.57 < 0.65.

6 Change the decimal 0.4 to the equivalent decimal in hundredths, 0.40. A decimal between 0.40 and 0.46 must have a 4 for the tenths digit and a hundredths digit between 0 and 6, that is 1, 2, 3, 4, or 5.
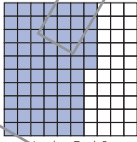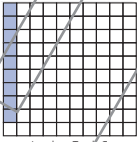

Extension Activity

Prepare a set of cards with decimals in tenths from 0.1 to 0.9 and decimals in hundredths from 0.01 to 0.99. Prepare a spinner with three sections labeled >, <, and =. Mix the cards and deal five to each student in a small group. Place the rest facedown and turn over the first. The first student spins the spinner, reads the symbol, and places a card that meets the conditions on top of the face-up card. For example, if the card is 0.35 and the symbol is >, the student places a card that is greater than 0.35 and then takes another card from the deck. Students take turns spinning a symbol and placing a card. If a student does not have a card to complete the comparison, he or she returns a card to the bottom of the deck and takes another as play passes to the left. Play continues until the entire deck has been used or no further comparisons can be made.