

Just in Time Quick Check

Standard of Learning 4.NS.4

Strand: Number and Number Sense

Standard of Learning 4.NS.4

The student will use mathematical reasoning and justification to represent, compare, and order decimals through thousandths, with and without models.

Students will demonstrate the following Knowledge and Skills:

- a) Investigate and describe the ten-to-one place value relationship for decimals through thousandths, using concrete models (e.g., place value mats/charts, decimal squares, base 10 blocks).
- b) Represent and identify decimals expressed through thousandths, using concrete, pictorial, and numerical representations.
- c) Read and write decimals expressed through thousandths, using concrete, pictorial, and numerical representations.
- d) Identify and communicate, both orally and in written form, the place and value of each digit in a decimal through thousandths (e.g., given 0.385, the 8 is in the hundredths place and has a value of 0.08).
- e) Compare using symbols ($<$, $>$, $=$) and/or words (*greater than*, *less than*, *equal to*) and order (least to greatest and greatest to least), a set of no more than four decimals expressed through thousandths, using multiple strategies (e.g., benchmarks, place value, number lines). Justify comparisons with a model, orally, and in writing.

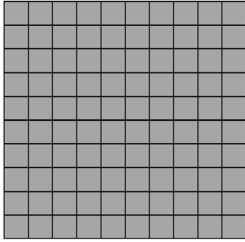
Just in Time Quick Check

Just in Time Quick Check Teacher Notes

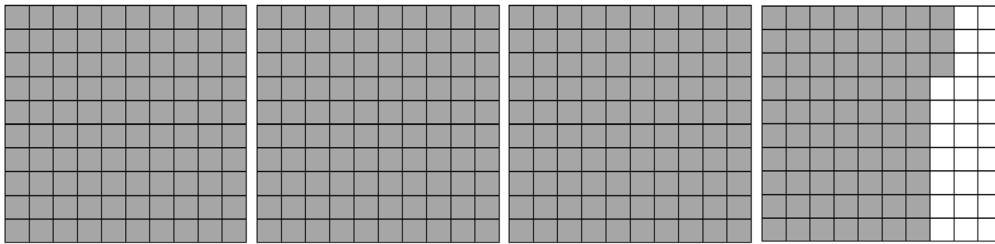
Supporting and Prerequisite SOL: 4.NS.5, 4.CE.4, 3.NS.4 (decimal notation when writing money amounts)

Just in Time Quick Check 4.NS.4

1. This model represents one whole.



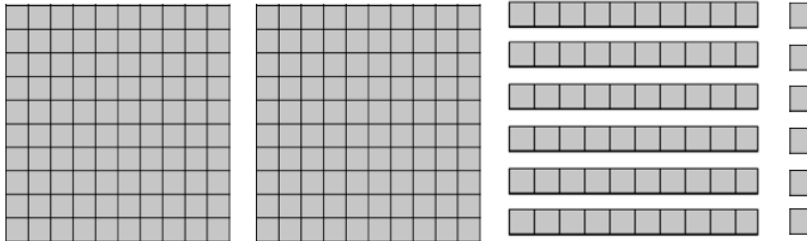
What decimal number does this model represent?



2. This model represents one whole.



What decimal number does this model represent?



3. Complete the chart to show the place value of each digit in the number 7.524.

Digit	Place	Value
5	tenths	
4		
7	ones	
2		0.02

4. Write this decimal number in standard form.

“nine hundred eighty-one thousandths”

5. Miki says that 5.069 is greater than 5.3. Is Miki correct? Justify your reasoning.

6. Complete each number sentence to make the statement true. Use no more than five digits in each number. You may use digits more than one time.

0	1	2	3	4	5	6	7	8	9
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1.01 =
< 1.101
> 2.054

7. Write the following numbers in order from least to greatest.

7.8

7.68

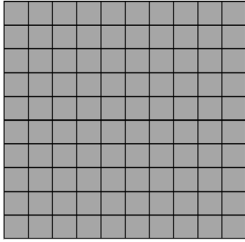
7.608

7.086

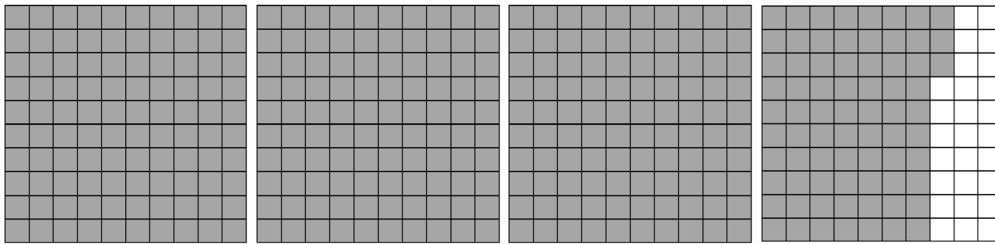
4.NS.4 Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

1. This model represents one whole.



What decimal number does this model represent?



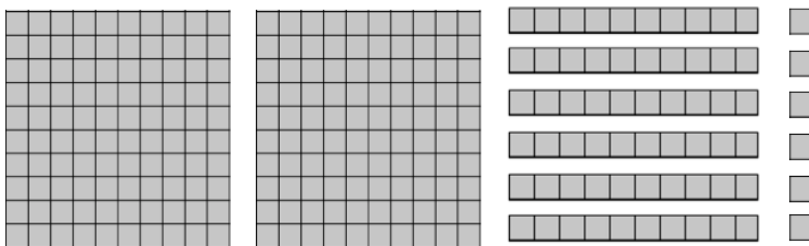
A common error is for students is to use whole number base-ten place value thinking rather than recognizing that this model represents a decimal number. Instead of recognizing the whole as one unit, some students may transfer the whole number value of the “flat” and read it as one hundred. This error may result in students stating that this model represents the number 373 instead of writing it correctly as the decimal number 3.73.

It may be helpful to provide students with multiple practice opportunities arranging flats, rods, and units to create decimal numbers in a place value chart based on a teacher-defined whole. It may also be helpful for students to place digit cards in the chart to label their block representation with the standard form of the decimal number.

2. This model represents one whole.



What decimal number does this model represent?



A common misconception for some students is thinking that the flat always represents one whole when modeling decimals. Students with this misconception would read this number as 2.66 rather than 26.6.

Students may benefit from experiences modeling with concrete materials that push them to determine the value with varying models serving as the whole. For example, students may use 1 flat, 4 rods, and 2 units to model a number. Students would then think about the value of the number if a flat was the whole (1.42), if a rod was the whole (14.2), or if a unit was the whole (142). They may also be pushed to think about the value if a cube was the whole (0.142).

Students may also benefit from starting with a number first and then creating the number with concrete materials, after being told which piece represents a whole. For example, students could be asked to model 24.5 if a rod is the whole.

3. Complete the chart to show the place value of each digit in the number 7.524.

Digit	Place	Value
5	tenths	
4		
7	ones	
2		0.02

A common error is assuming that the numbers listed in the chart are in the same order as the digits in the number. As a result, some students may misrepresent decimals when assigning place and value to digits. It may be helpful to provide students with opportunities to assign digits, values, and places of decimal numbers in charts or other formats when digits are listed in random order.

Another strategy that may benefit students who have difficulty determining the place and value of decimal numbers is to use a place value chart and concrete manipulatives. Give students opportunities to use the chart as they read numbers in written form aloud to themselves and then build the number. Using flats, rods, and units to model the number will help build conceptual understanding of the place and value of each number. Connecting the conceptual to written (place value chart) and symbolic (decimal form) will strengthen students' understanding.

4. Write this decimal number in standard form.

“nine hundred eighty-one thousandths”

Some students may incorrectly apply their knowledge and experience with whole numbers to reading and writing decimal numbers. In this question, a student response may be 981 with no representation of the decimal point or decimal place values when the correct response reads 0.981. Another common error is for students to ignore the -ths in thousandths and read the number as “nine hundred eighty one thousand” and writing 981,000.

It may be helpful to provide some students with a decimal place value chart that shows the decimal places in the order that they appear in numbers. It may also be beneficial to include a clearly marked space in the chart for the decimal point, paired with a reference to the word “and” to facilitate the process of reading and writing decimal numbers from standard form.

5. Miki says that 5.069 is greater than 5.3. Is Miki correct? Justify your reasoning.

A common misconception for some students is thinking that a number with more digits is always greater than a number with fewer digits. This misconception may be caused by applying whole number reasoning to decimal numbers. This thinking neglects the importance of the decimal point placement to the value of the digits in the number.

Students may need to build conceptual understanding of decimals by using base 10 blocks to construct decimal numbers and then comparing the models. Using concrete materials provides visual cues that help students understand the importance of considering the place of each digit when comparing.

Concrete materials like base 10 blocks can also be used to help students understand that a number like 5.3 is equivalent to 5.300 because 3 tenths is equivalent to 300 thousandths. Developing understanding of equivalent decimal relationships will help students as they compare decimals.

Using a place value chart as a visual aid for comparing the individual digits in a number may help students see the importance of the place of a number when comparing. For visual continuity, teachers can suggest that students place a zero where no digit is represented. In this question, the tenths place confirms that 5.3 is greater than 5.069. Example:

Ones	.	Tenths	Hundredths	Thousandths
5	.	0	6	9
5	.	3	0	0

6. Complete each number sentence to make the statement true. Use no more than five digits in each number. You may use digits more than one time.

0	1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---

1.01 =
< 1.101
> 2.054

A common error for students is confusing the greater than symbol with the less than symbol. It may be helpful to begin by comparing whole numbers using concrete representations and comparison words. As students become confident with comparison words, they can transition to using symbols and concrete representations of decimal numbers. Finally, students can transition to using symbols to compare decimals in standard form. Additionally, the use of a place value chart as a visual aid for comparing the individual digits in a number can also help students see the importance of the place of a number when comparing.

7. Write the following numbers in order from least to greatest.

7.8

7.68

7.608

7.086

Students may demonstrate several common errors when ordering decimal numbers. For example, students may only focus on the number of digits in each number and determine that numbers with more digits represent numbers greater than those with fewer digits. This may result in students ordering the given decimals from least to greatest as 7.8, 7.68, 7.086, 7.608. Similarly, students may think of the “whole number” value of the digits in the number, resulting in an order of 78, 768, 7,086, 7,608. This error may indicate that students did not consider the place of each digit when comparing and ordering the numbers.

In addition to building models of decimal numbers with concrete materials, students may benefit from focusing on only two numbers at a time. These students can choose two numbers to compare and use place value thinking (and a place value chart, if needed) to order the two numbers. After ordering two numbers, these students can compare a third number to the first two numbers and determine where it should go in the order and then repeat this process with the last number.

Another visual that may be helpful for students is stacking the numbers on top of each other. As students stack, they line the numbers up by lining up the decimal point and each of the places. This provides students with a method to compare each number in its place value.

7.8

7.68

7.608

7.086

In the above example, students can see the smallest number is 7.086, followed by 7.608, 7.68, and 7.8.