MA.4.NSO.1.5

Overarching Standard: *MA.4.NSO.1 Understand place value for multi-digit numbers.*

Benchmark of Focus

MA.4.NSO.1.5: Plot, order and compare decimals up to the hundredths.

Examples: The numbers 3.2; 3.24 and 3.12 can be arranged in ascending order as 3.12; 3.2 and 3.24.

Benchmark Clarifications

Clarification 1: When comparing numbers, instruction includes using an appropriately scaled number line and using place values of the ones, tenths and hundredths digits.

Clarification 2: Within the benchmark, the expectation is to explain the reasoning for the comparison and use symbols (<, > or =).

Clarification 3: Scaled number lines must be provided and can be a representation of any range of numbers.

Related Benchmark/Horizontal Alignment

- MA.4.NSO.2.6/2.7
- MA.4.FR.1.2/1.4
- MA.4.DP.1.1/1.3

Vertical Alignment

Previous Benchmarks	Next Benchmarks
MA.3.NSO.1.3	MA.5.NSO.1.4

Purpose and Instructional Strategies

The purpose of this benchmark is for students to plot, order and compare decimals using place value. Grade 4 contains the first work with decimals. During instruction make connections to decimal fractions (e.g., $\frac{1}{10}$, $\frac{1}{100}$) (MA.4.FR.1.2).

- For instruction, teachers should show students how to represent these decimals on scaled number lines. Students should use place value understanding to make comparisons.
- Students learn that the names for decimals match their fraction equivalents (e.g., 2 tenths = 0.2 = $\frac{2}{10}$)
- Students build area models (e.g., a 10 x 10 grid) and other models to compare decimals.

Common Misconceptions or Errors

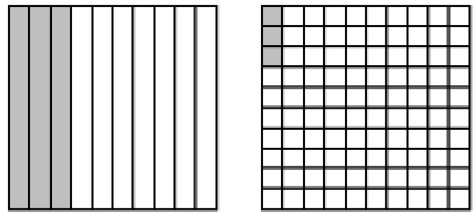
- Students treat decimals as whole numbers when making comparison of two decimals. They think the longer the number, the greater the value. For example, they think that 0.04 is greater than 0.4.

Strategies to Support Tiered Instruction

- Instruction includes the use of place value understanding, decimal fractions and decimal grids to compare decimals.
    - For example, students compare 0.14 and 0.2 using decimal fractions. The teacher begins instruction by having students write each decimal as a fraction, $\frac{14}{100}$ and $\frac{2}{10}$. The teacher explains that $\frac{2}{10}$ is equal to $\frac{20}{100}$ because if we multiply the numerator and denominator of $\frac{2}{10}$ by 10, we generate the equivalent fraction $\frac{2}{10} = \frac{2x10}{10x10} = \frac{2}{100}$. Next, the teacher compares the fractions to determine that $\frac{14}{100} < \frac{20}{100}$, so 0.14 <0.2.
    - For example, students use place value understanding and a place value chart to compare 0.14 and 0.2. The teacher explains that when comparing decimals, we start with the digit to the far left because we want to compare the greatest place values first. Both values have a 0 in the ones place, so we will move to the tenths place. One tenth is less than two tenths, so 0.14 < 0.2.

tens	ones	tenths	hundredths
	0	1	4
	0	2	

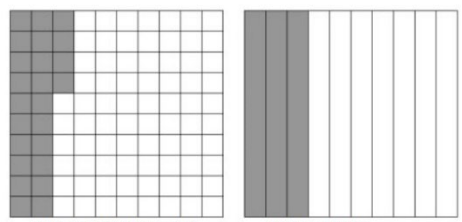
    - For example, students compare 0.3 and 0.03 using decimal fractions. The teacher begins instruction by having students write each decimal as a fraction, $\frac{3}{10}$ and $\frac{3}{100}$. The teacher then explains to students that $\frac{3}{10}$ is equal to $\frac{30}{100}$, because if we multiply the numerator and denominator of $\frac{3}{10}$ by 10, we generate the equivalent fraction $\frac{3}{10} = \frac{3x10}{10x10} = \frac{30}{100}$.. Next, the teacher compares the fractions to determine that $\frac{30}{100} > \frac{3}{100}$, so 0.3 > 0.03.
    - For example, students compare 0.3 and 0.03 using decimal grids, representing each value and explain that 0.3 covers a greater are of the decimal grid than 0.03, so 0.3 is greater than 0.03.



Questions to ask students:

How can you use a model to compare 0.24 and 0.37?

- Sample answer that indicates understanding: 0.24 < 0.3; 0.3 covers more space in the model. Using place value, I can use the tenths place to compare that 3 tenths are greater than 2 tenths.



0.24 or "twenty-four hundredths" 0.3 or "three tenths"

How does 0.3 (three tenths) compare to 0.30 (thirty hundredths)? Explain your reasoning.

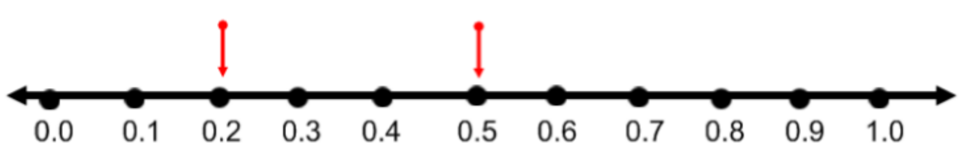
- Sample answer that indicates understanding: The student correctly answers that the decimals are equal and explains or proves their thinking with models or words. For example, both numbers have a 3 in the tenths place, and draws a model showing 3 tenths covers the same amount as 30 hundredths.

How does 5.64 (five and sixty-four hundredths) compare to 5.46 (five and forty-six hundredths)? Explain your reasoning.

- Sample answer that indicates understanding: The first place that we can use to compare the values is the tenths place. There are 6 tenths in 5.64 and 4 tenths in 5.46. So, 5.64 is greater than 5.46.

How can you represent 0.5 and 0.2 on a number line? Use <, =, > to compare the two decimals.

- Sample answer that indicates understanding: The student correctly plots the values on a number line and creates the expression 0.5 > 0.2



Instructional Tasks

Instructional Task 1

Use relational symbols to fill in the blanks to compare the numbers.

1. $3\ \mathit{tenths} + 5\ \mathit{hundredths}$__________$3\ \mathit{tenths} + 11\ \mathit{hundredths}$
2. $4\ \mathit{hundredths} + 5\ \mathit{tenths}$__________$1\ \mathit{tenth} + 33\ \mathit{hundredths}$
3. $4\ \mathit{hundredths} + 1\ \mathit{tenth}$__________$1\ \mathit{tenth} + 4\ \mathit{hundredths}$
4. $5\ \mathit{hundredths} + 1\ \mathit{tenth}$__________$15\ \mathit{hundredths} + 0\ \mathit{tenths}$
5. $5\ \mathit{hundredths} + 1\ \mathit{tenth}$____$0\ \mathit{tenths} + 15\ \mathit{hundredths}$

Instructional Items

Instructional Item 1

Select all the values that would make the comparison 0.6 >___ a true statement.

a. 0.06

b. 0.70

c. 0.8

d. 0.5

e. 0.4

Achievement Level Descriptors

Benchmark	Context	Assessment Limits
MA.4.NSO.1.5 Plot, order and compare decimals up to the hundredths. Example: The numbers 3.2; 3.24 and 3.12 can be arranged in ascending order as 3.12; 3.2 and 3.24. Clarification 1: When comparing numbers, instruction includes using an appropriately scaled number line and using place values of the ones, tenths, and hundredths digits. Clarification 2: Within the benchmark, the expectation is to explain the reasoning for the comparison and use symbols (<, >, or =). Clarification 3: Scaled number lines must be provided and can be a representation of any range of numbers.	Mathematical	Items using relational symbols are limited to two multi-digit numbers. Items involving comparison may use relational words but must use relational symbols.

ALD 2	ALD 3	ALD 4	ALD 5
plots and compares decimals up to the tenths using comparison symbols (<, >, =).	plots and compares decimals up to the hundredths using comparison symbols (<, >, =).	plots, orders, and compares decimals up to the hundredths.	identifies an error; plots, orders, and compares decimals up to the hundredths.

Additional Resources:

CPALMS Resources: https://www.cpalms.org/PreviewStandard/Preview/15345

Khan Academy: Comparing Decimals Visually https://tinyurl.com/rumu5xmp

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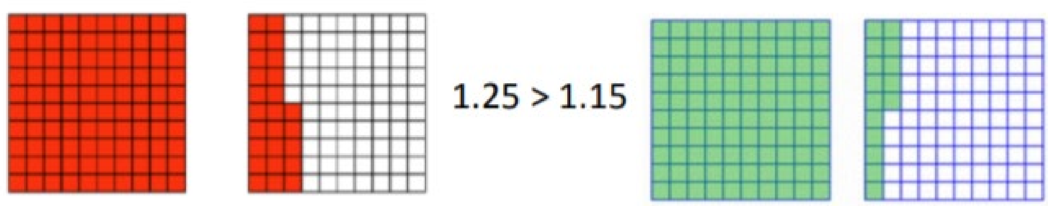
Resources/Tasks to Support Your Child at Home:

Using a deck of cards, play decimal war. Have your child create a two-digit decimal (to the hundredths place) and you create a two-digit decimal (to the hundredths place). Compare the two decimals, whomever has the greatest decimal wins the round. Prove the comparison with a number line, area model or place value. (Example: Compare using place value: "*I have 0.26 and you have 0.62. You have the greatest decimal because I have a 2 in the tenths place and you have a 6 in the tenths place."*) Then record the comparisons using the symbols <, > or =. After 10 rounds, switch to go greater than a whole (using three digits: the ones, tenths and hundredths place).

Example: How does 1.25 compare to 1.15?



9.25 < 9.7