MA.3.FR.2.1

Overarching Standard: MA.3.FR.2 *Order and compare fractions and identify equivalent fractions.*

Benchmark of Focus

MA.3.FR.2.1: Plot, order and compare fractional numbers with the same numerator or the same denominator.

Example: The fraction $\frac{3}{2}$ is to the right of the fraction $\frac{3}{3}$ on a number line so $\frac{3}{2}$ is greater than $\frac{3}{3}$.

Benchmark Clarifications:

Clarification 1: Instruction includes making connections between using a ruler and plotting and orderingfractions on a number line.

Clarification 2: When comparing fractions, instruction includes an appropriately scaled number line and using reasoning about their size.

Clarification 3: Fractions include fractions greater than one, including mixed numbers, with denominators limited to 2, 3, 4, 5, 6, 8, 10 and 12.

Related Benchmark/Horizontal Alignment

- MA.3.FR.2.2
- MA.3.NSO.1.3

Vertical Alignment

Previous Benchmarks	**Next Benchmarks**
MA.2.NSO.1.3	MA.4.FR.1.4 MA.4.FR.1.3

Terms from the K-12 Glossary

- Number line

Purpose and Instructional Strategies

The purpose of this benchmark is for students to plot and order fractions with the same numerator (e.g., $\frac{3}{4}$, $\frac{3}{2}$, $\frac{3}{8}$) or fractions with the same denominator (e.g., $\frac{3}{5}$, $\frac{10}{5}$, $\frac{7}{5}$) to compare them by their location on a number line.

- During instruction, teachers should provide students opportunities to practice using the number line, which will assist students with understanding the difference in size when fractions have the same numerator (the size of the parts) and with comparing fractions with the same denominator (number of parts) (MTR.2.1).
- Through making connections to rulers, students see that appropriately scaled number lines allow for comparisons of fraction size. Students should also utilize open number lines as to practice creating their own appropriately scaled number lines (MTR.2.1).

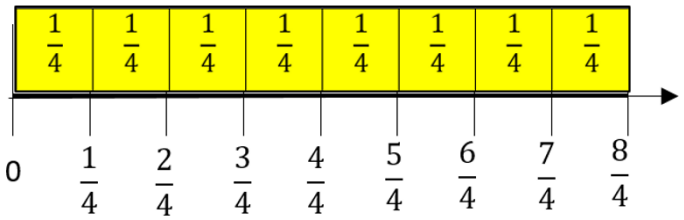
- Instruction should model that fractional units on a number line represent intervals that are its unit fraction in size. For example, $\frac{5}{3}$ on a number line is represented by 5 units from 0 that are each one-third in length. Second, number lines help students see comparisons of fractions to the same whole and will continue as students compare fractions with different numerators and denominators in Grade 4. Finally, number lines reinforce Clarification 3 for MA.3.FR.1.3, that fractions are numbers (MTR.2.1, MTR.5.1).

Common Misconceptions or Errors

- Students can confuse that when numerators are the same in fractions, larger denominators represent smaller pieces, and smaller denominators represent larger pieces.
- When fraction comparisons are made using area models, students may confuse that the size of the whole for each model must be the same size.

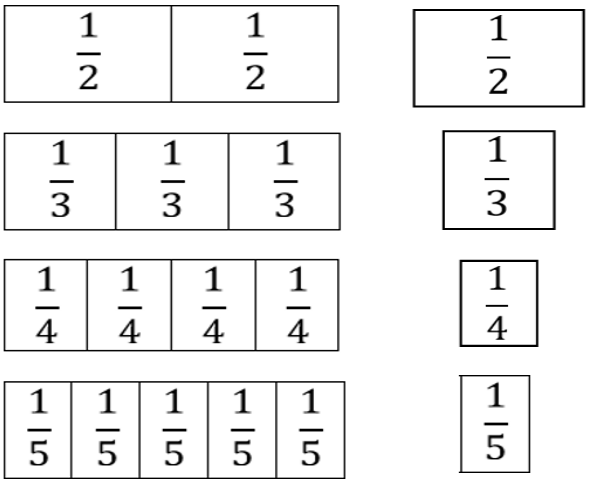
Strategies to Support Tiered Instruction

- Instruction includes opportunities to use concrete models and drawing of number lines to connect learning with fraction understanding.
    - For example, students plot fourths on the number line. Utilizing fraction strips or tiles, students can connect fractional parts to the measurement on a number line.



Conversation includes what students notice about the fraction on the number line. "How many fourths are in three-fourths? What do we notice about the size of $\frac{1}{4}$ compared to $\frac{3}{4}$?" Students have opportunities to describe the distance from the 0 as well as the distance from other benchmark fractions.

- Instruction includes opportunities to use fraction manipulatives, concrete models and drawings. The teacher begins instruction by modeling fractional pieces with their fraction name. It is important that students see that the fractions that they are building and comparing refer to the same size whole.
    - For example, students build fractions tiles or models to equal the same size one whole like below.



Students pull out the unit fraction of each of the fraction models. Conversations include what students notice about the size of each piece and what students notice about the size of the piece compared to the denominators. "Why is $\frac{1}{2}$ larger than $\frac{1}{5}$?"

Questions to ask students:

Ask students to explain how a number line with fractions is similar to a ruler.

- *Sample answer that indicates understanding:* Inches on a ruler and whole numbers on a number line are both partitioned into equal parts that represent fractional amounts (halves, fourths).

Ask students how to compare fractions with the same numerator.

- *Sample answer that indicates understanding:* When fractions have the same numerator, use the denominators to compare the size of the pieces. The greater the number of equal parts (denominator) in the whole, the smaller the size of the pieces.
- *Sample answer that indicates incomplete understanding or a misconception:* The greater the denominator, the smaller the fraction.

Ask students how to compare fractions with the same denominator.

- *Sample answer that indicates understanding:* When the denominators are the same, use the numerators to compare the number of equal parts or to compare their locations on a number line.
- *Sample answer that indicates incomplete understanding or a misconception:* The greater the numerator, the bigger the fraction.

Instructional Tasks

Instructional Task 1

Clara says that $\frac{5}{4}$ is greater than $\frac{5}{2}$ because 4 is greater than 2. Prove why she is incorrect using the number line below.

Instructional Items

Instructional Item 1

Order the fractions below from least to greatest.

$$\frac{8}{5}, \frac{8}{3}, \frac{8}{10}, \frac{8}{1}$$

Instructional Item 2

Compare 7 fourths and 3 fourths using <, =, *or* >.

Achievement Level Descriptors

Benchmark	Context	Assessment Limits
MA.3.FR.2.1 Plot, order and compare fractional numbers with the same numerator or the same denominator. Example: The fraction $\frac{3}{2}$ is to the right of the fraction $\frac{3}{3}$ on a number line so $\frac{3}{2}$ is greater than $\frac{3}{3}$.	Both	Fractions must reference the same whole. Items with given number lines will include only whole number marks labeled on the number

Clarification 1: Instruction includes making connections between using a ruler and plotting and ordering fractions on a number line. Clarification 2: When comparing fractions, instruction includes an appropriately scaled number line and using reasoning about their size. Clarification 3: Fractions include fractions greater than one, including mixed numbers, with denominators limited to 2, 3, 4, 5, 6, 8, 10 and 12.			lines. Number lines in the answer options may include fractional marks labeled on the number line. Items involving comparison may use relational words but must use relational symbols.
ALD 2	**ALD 3**	**ALD 4**	**ALD 5**
plots fractional numbers with the same numerator or the same denominator.	plots and compares fractional numbers with the same numerator or the same denominator.	plots, orders, and compares fractional numbers with the same numerator or the same denominator.	identifies an error; plots, orders, and compares fractional numbers with the same numerator or the same denominator.

Additional Resources:

CPALMS Resources

Video: Exploring the Number Line Model of Fractions

Resources/Tasks to Support Your Child at Home:

Ask, "Aaron ran $\frac{7}{6}$ miles. Martin ran $\frac{7}{4}$ miles. Who ran farther? Prove how you know using a number line."

Fraction War – record various fractions on index cards to play war.

Using an open number line, have your child break the whole into sixths. Ask them to find $\frac{3}{6}$ and $\frac{4}{6}$ on the number line and explain how the amounts compare.

Khan Academy: Fractions on a number line

Khan Academy: Comparing fractions with the same denominator

Khan Academy: Comparing fractions with the same numerator

LearnZillion Video: Compare fractions with the same denominator by reasoning about their size

LearnZillion Video: Compare fractions with the same numerator by reasoning about their size

LearnZillion Video: Compare fractions with the same numerator: using the greater than and less than symbols