

MA.4.FR.1.2

Overarching Standard: *MA.4.FR.1* Develop an understanding of the relationship between different fractions and the relationship between fractions and decimals.

Benchmark of Focus

MA.4.FR.1.2: Use decimal notation to represent fractions with denominators of 10 or 100, including mixed numbers and fractions greater than 1, and use fractional notation with denominators of 10 or 100 to represent decimals.

Benchmark Clarifications

Clarification 1: Instruction emphasizes conceptual understanding through the use of manipulatives visual models, number lines or equations.

Clarification 2: Instruction includes the understanding that a decimal and fraction that are equivalent represent the same point on the number line and that fractions with denominators of 10 or powers of 10 may be called decimal fractions.

Related Benchmark/Horizontal Alignment

- MA.4.NSO.1.5
- MA.4.NSO.2.6/2.7
- MA.4.M.1.1/1.2
- MA.4.M.2.2

Vertical Alignment

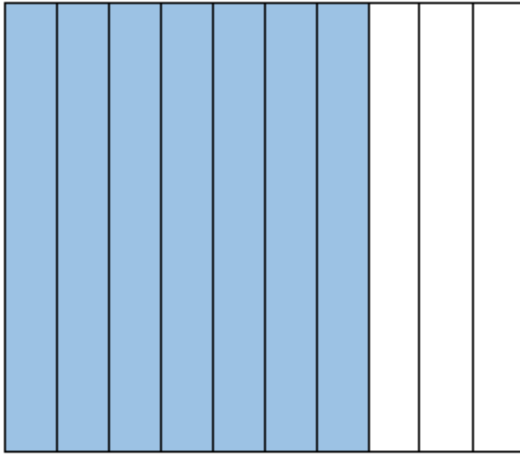
Previous Benchmarks	Next Benchmarks
MA.3.FR.2.2	MA.6.NSO.3.5

Purpose and Instructional Strategies

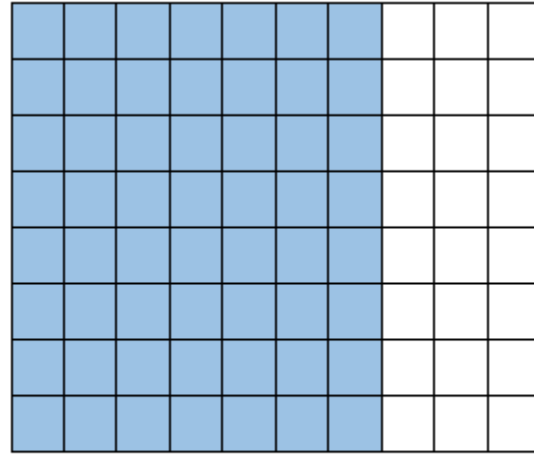
The purpose of this benchmark is to connect fractions to decimals. Students extend their understanding of fraction equivalence (MA.3.FR.2.2) to include decimal fractions with denominators of 10 or 100. The connection will continue in Grade 6 (MA.6.NSO.3.5) and completed in Grade 7 (MA.7.NSO.1.2).

- Instruction should help students understand that decimals are another way to write fractions. The place value system developed for whole numbers extends to fractional parts represented as decimals. The concept of one whole used in fractions is extended to models of decimals. It is important that students make connections between fractions and decimals in models.
- Instruction should provide visual fraction models of tenths and hundredths, number lines, and equations so that students can express a fraction with a denominator of 10 as an equivalent fraction with a denominator of 100.

- Students reinforce understanding that the names for decimals match their fraction equivalents (e.g., *seven tenths, 7 tenths, 0.7, $\frac{7}{10}$, seventy hundredths, 70 hundredths, 0.70 and $\frac{70}{100}$ are all equivalent.*)



$$\frac{7}{10} = .7$$



$$\frac{30}{100} = .30$$

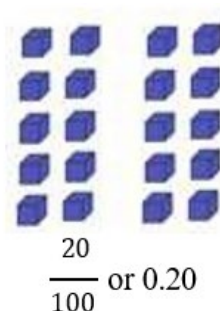
- This benchmark is a connection point to the metric system and will be explored in MA.4.M.1.2.

Common Misconceptions or Errors

- Students often confuse decimals such as 6 tenths and 6 hundredths. Students should use models and explain their reasoning to develop their understanding about the connections between fractions and decimals.
- Some students may not understand that fractions and decimals are different presentations of the same thing. Number lines and other visual models will help students gain a better understanding of this concept.

Strategies to Support Tiered Instruction

- Instruction includes building fractions and their decimals equivalents using base ten blocks.
 - For example, students build $\frac{2}{10}$ “two-tenths” and $\frac{20}{100}$ “twenty hundredths” with base ten blocks while using vocabulary that will help students see the decimal connection as well. Students realize that the numbers have the same value.



Questions to ask students:

What is the value of the digit 5 in 23.54?

- Sample answer that indicates understanding: The student correctly answers the value of the digit 5 is 5 tenths (0.5 or $\frac{5}{10}$)
- Sample answer that indicates an incomplete understanding: The student answers only “the tenths place” (place value rather than value of the digit 5) or is incorrect in their response (ex. 5 hundredths)

How does the value of the digit 5 in 23.54 relate to one whole?

- Sample answer that indicates understanding: The student correctly explains that 5 tenths means there are 5 out of 10 parts to make the next whole one (or there are 54 parts out of 100 parts to make the next whole one)

How can you rename $\frac{2}{100}$ as a decimal?

- Sample answer that indicates understanding: The fraction $\frac{2}{100}$ represents two hundredths, so the digit 2 should be in the hundredths place, which is two places after the decimal point, so 0.02 or .02

How can you rename 0.34 as a fraction?

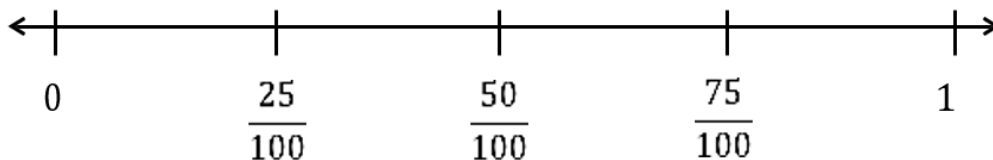
- Sample answer that indicates understanding: Since we can read 0.34 as *thirty-four hundredths*, and we know the 4 is in the hundredths place, we know the equivalent fraction is $\frac{34}{100}$

Instructional Tasks

Instructional Task 1:

Read the following numbers and use the benchmark fractions to place them on the number line.

- 0.8
- 0.32
- 0.6
- 0.17



Instructional Items

Instructional Item 1

A value is shown

$$2\frac{5}{100}$$

What is the value in decimal form?

- a. 0.25
- b. 2.05
- c. 2.5
- d. 25.100

Achievement Level Descriptors

Benchmark		Context	Assessment Limits
MA.4.FR.1.2 Use decimal notation to represent fractions with denominators of 10 or 100, including mixed numbers and fractions greater than 1, and use fractional notation with denominators of 10 or 100 to represent decimals. Clarification 1: Instruction emphasizes conceptual understanding through the use of manipulatives visual models, number lines or equations. Clarification 2: Instruction includes the understanding that a decimal and fraction that are equivalent represent the same point on the number line and that fractions with denominators of 10 or powers of 10 may be called decimal fractions.		Mathematical	Items including models should not require a specific strategy.
ALD 2	ALD 3	ALD 4	ALD 5
represents fractions less than one with denominators of 10 or 100 in decimal notation including the use of models.	uses decimal notation to represent fractions less than one with denominators of 10 or 100 and uses fractional notation with denominators of 10 or 100 to represent decimals. relates and represents dollars and cents as whole numbers and decimals.	uses decimal notation to represent fractions with denominators of 10 or 100, including mixed numbers and fractions greater than 1, and uses fractional notation with denominators of 10 or 100 to represent decimals.	identifies an error and represents fractions as decimals and decimals as fractions.

Additional Resources:

[CPALMS Resources](#)

[Video: Connection fractions and decimals](#)

[Identifying tenths on a number line](#)

[Identifying hundredths on a number line](#)

Resources/Tasks to Support Your Child at Home:

Using a deck of cards, have your child choose a number 1-9. Have them create that number as a fraction with a denominator of 10. Have them represent the fraction using an area model or number line. Then determine what the equivalent fraction with a denominator of 100 would be, and the equivalent decimals. (Example: I choose a 2. I can represent it as $\frac{2}{10}$, or $\frac{20}{100}$, 0.2 or 0.20).

Khan Academy: [Writing fractions as decimals](#)