MA.4.FR.1.3

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.1.3: Identify and generate equivalent fractions, including fractions greater than one. Describe how the numerator and denominator are affected when the equivalent fraction is created.

Benchmark Clarifications

Clarification 1: Instruction includes the use of manipulatives, visual models, number lines or equations.
Clarification 2: Instruction includes recognizing how the numerator and denominator are affected when equivalent fractions are generated

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Related Benchmark/Horizontal Alignment

- MA.4.FR.2.1/2.3
- MA.4.M.1.1/1.2
- MA.4.DP.1.1/1.2

Vertical Alignment

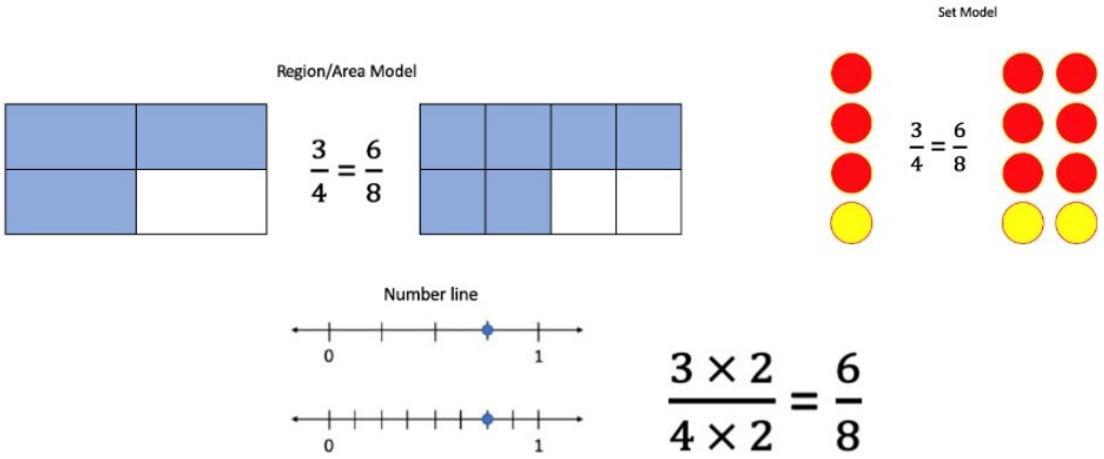
Previous Benchmarks	Next Benchmarks
MA.3.FR.2.2	MA.5.FR.2.1.

Purpose and Instructional Strategies

The purpose of this benchmark is for students to begin generating equivalent fractions. This work builds on identifying equivalent fractions in Grade 3 (MA.3.FR.2.2) and builds the foundation for adding and subtracting fractions with unlike denominators in Grade 5 (MA.5.FR.2.1).

- For instruction, students should use multiple models to develop understanding of equivalent fractions (MTR.2.1). Students should use area models, set models, number lines and equations to determine and generate equivalent fractions.
- Instruction should focus on reasoning about how the numerator and denominators are affected when equivalent fractions are generated.
- Reasoning about the size of a fraction using benchmark fractions helps solidify students' understanding about the size of the fraction.

- This work should also be done with fractions equal to and greater than one.

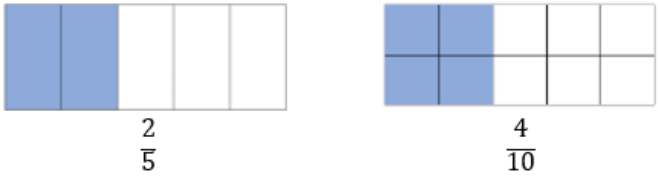


Common Misconceptions or Errors

- Students think that when generating equivalent fractions, they need to multiply or divide only the numerator or only denominator, such as changing $\frac{3}{4}$ to $\frac{3}{8}$.

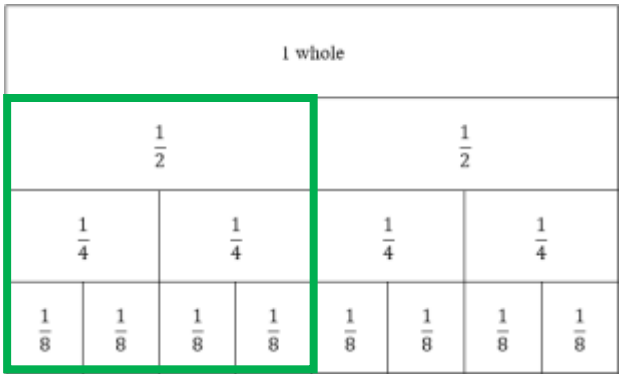
Strategies to Support Tiered Instruction

- Instruction includes opportunities to use concrete models and drawings to solidify understanding of fraction equivalence. Students use models to describe why fractions are equivalent or not equivalent when referring to the same size whole.
    - For example, when looking at $\frac{2}{5}$ and $\frac{4}{10}$, conversation includes that both fraction models are the same size. So, when comparing them, we are comparing the same size whole. Students should be able to see that 2 out of the 5 are shaded in the first model and 4 out of the 10 are shaded in the second mode, making the $\frac{2}{5}$ equal to $\frac{4}{10}$.



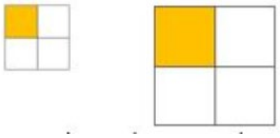
- Instruction includes fraction tiles or fraction kits to physically place and see equivalent fractions of a model. Students line up fraction tiles and begin to make observations about equivalence. One-half is equivalent to 2 one-fourth pieces. Students then notice that those pieces are then equivalent to 4 one-eighth pieces. Once students have this understanding, then they can begin to rename fractions.

- Example:



Questions to ask students:

- **Present students with two visual models of one-fourth with different size wholes (see model below). Have students explain whether the wholes are equivalent.**



- Sample answer that indicates understanding: Even though both models represent one-fourth, they are not equivalent, because the wholes are not the same size.

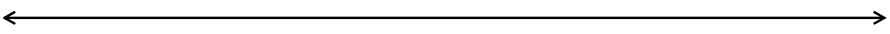
- **What does it mean for two fractions to be equivalent?**
- Sample answer that indicates understanding: The fractions are the same part of the same size whole. On a number line, they would be at the same point, and on an area model they would be the same portion of the whole.

- **How do you know that $\frac{1}{2} = \frac{2}{4}$? What is another fraction that is equivalent to $\frac{1}{2}$?**
- Sample answer that indicates understanding: Both fractions have a numerator that is one-half of the denominator. If you draw a model, the same portion (half) of the whole would be represented. Other fractions that are equivalent to $\frac{1}{2}$ are: $\frac{4}{8}, \frac{5}{10}, \frac{6}{12}$, etc.

Instructional Tasks

Instructional Task 1:

Divide the number line below into enough equal sections so that you can locate and label the point $\frac{2}{5}$. Divide the same number line with a different color so that you can locate and label the point $\frac{4}{10}$. Discuss what you have learned.



Instructional Items

Instructional Item 1:

Olivia modeled a fraction by shading parts of the rectangle as shown.

Ethan draws a rectangle with the same size to model a fraction equivalent to Olivia's. Which rectangle could Ethan have drawn?

a.

b.

c.

d.

Achievement Level Descriptors

Benchmark	Context	Assessment Limits
MA.4.FR.1.3 Identify and generate equivalent fractions, including fractions greater than one. Describe how the numerator and denominator are affected when the equivalent fraction is created. Clarification 1: Instruction includes the use of manipulatives, visual models, number lines or equations. Clarification 2: Instruction includes recognizing how the numerator and denominator are affected when equivalent fractions are generated.	Mathematical	Items with denominators of 10 will not have a focus on equivalence with denominators of 100, since this is the expectation of MA.4.FR.1.1. Items will not include mixed numbers. Fractions given in items must have denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, 16, and 100. Items with given number lines will include only whole number marks labeled on the number lines. Number lines in the answer options may include fractional marks labeled on the number line. Items including models should not require a specific strategy.

ALD 2	ALD 3	ALD 4	ALD 5
identifies equivalent fractions, including fractions greater than one, using models.	identifies and generates equivalent fractions, including fractions greater than one.	identifies and generates equivalent fractions, including fractions greater than one; describes how the numerator and denominator are affected when the equivalent fraction is created.	identifies an error and generates equivalent fractions using a variety of different methods and describes why they are equivalent.

Additional Resources:

CPALMS Resources

Khan Academy: Equivalent Fractions

Khan Academy: Visualizing Equivalent Fractions

Resources/Tasks to Support Your Child at Home:

Coach's Corner: Generating Equivalent Fractions – Understanding the Process

Equivalent Fraction Simulation and Game