Lesson 10: Use Multiples to Find Equivalent Fractions

Standards Alignments

Addressing 4.NF.A.1

Teacher-facing Learning Goals

- Make sense of a way to generate equivalent fractions by using multiples of the numerator and denominator.

Student-facing Learning Goals

- Let's look at a way to find equivalent fractions without using diagrams.

Lesson Purpose

The purpose of this lesson is for students to make sense of a way to identify and generate equivalent fractions by using multiples of the numerator and denominator.

Up until this point, students have used visual representations or other strategies to reason about and generate equivalent fractions. Along the way, they are likely to have noticed patterns in the numerator and denominator of equivalent fractions. While some students may have generalized and applied those observations intuitively, this is the first lesson in which students are prompted to reason numerically about the numbers in equivalent fractions.

Students notice that a fraction $\frac{a}{b}$ has the same location on the number line as a fraction $\frac{n \times a}{n \times b}$, so we can generate fractions that are equivalent to $\frac{a}{b}$ by multiplying both a and b by n. In other words, they can use multiples of a and b to generate fractions that are equivalent to $\frac{a}{b}$. Sample responses are shown in the form $\frac{5 \times 2}{6 \times 2} = \frac{10}{12}$ but students do not need to use this notation.

In an upcoming lesson, students will reason in the other direction: using factors that are common to a and b to write equivalent fractions. They will see that dividing a and b by the same factor n gives a fraction equivalent to $\frac{a}{b}$.

Access for:

Students with Disabilities

- Action and Expression (Activity 2)

English Learners

- MLR2 (Activity 1)

Instructional Routines

Notice and Wonder (Warm-up)

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

To reason numerically we hope students begin to describe number relationships without visual representations. Did it seem that students were doing this in today's lesson? Which diagrams are they still holding on to?

Cool-down (to be completed at the end of the lesson)

5 min

Fractions of the Same Size

Standards Alignments

Addressing 4.NF.A.1

Student-facing Task Statement

1. Find two fractions that are equivalent to $\frac{3}{8}$. Explain or show your reasoning.
2. Decide if each of the following fractions are equivalent to $\frac{9}{4}$.
   a. $\frac{10}{8}$
   b. $\frac{16}{10}$
   c. $\frac{18}{8}$
   d. $\frac{27}{12}$

Student Responses

1. Sample response: $\frac{6}{16}$ and $\frac{9}{24}$. $\frac{3 \times 2}{8 \times 2} = \frac{6}{16}$ and $\frac{3 \times 3}{8 \times 3} = \frac{9}{24}$
2. a. No
   b. No
   c. Yes
   d. Yes