Lesson 8: Equivalent Fractions on the Number Line

Standards Alignments

Building On   3.NF.A.1
Addressing   4.NF.A.1

Teacher-facing Learning Goals

- Reason about and generate equivalent fractions on the number line.

Student-facing Learning Goals

- Let's use number lines to reason about equivalent fractions.

Lesson Purpose

The purpose of this lesson is for students to reason about and generate equivalent fractions on the number line.

Previously, students generated equivalent fractions in any way that was intuitive to them. In this lesson, students use number lines to reason about and generate equivalent fractions. In particular, they experiment with partitioning a fractional part on the number line into smaller equal-size parts. Through repeated reasoning, students begin to notice regularity in the numerator and denominator of the equivalent fractions—namely, that the numbers are multiples of those in the original fraction. The experience of sub-partitioning number lines prepares students to formalize their observation and reason numerically about equivalent fractions in upcoming lessons.

In this lesson, students take a closer look at the relationships between fractions with denominator 5, 10, and other multiples of 5. They begin to consider the meaning of fractions with denominator 100.

Access for:

♿ Students with Disabilities

- Engagement (Activity 1)

🌐 English Learners

- MLR8 (Activity 1)

Instructional Routines

Estimation Exploration (Warm-up)

Materials to Gather

- Tape (painter's or masking): Activity 1

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

Teacher Reflection Question

In past lessons and in grade 3, students partitioned unit fractions such as $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ (on fraction strips, tape diagrams, and number lines) into smaller fractional parts such as $\frac{1}{6}$ and $\frac{1}{8}$. How readily did students transfer those insights to work with fractions with larger denominators on the number line? What was intuitive to them and what wasn't?

Cool-down (to be completed at the end of the lesson)   🕐 5 min
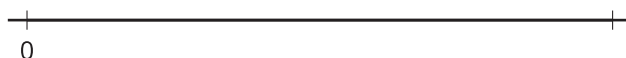
In Search of Equivalence

Standards Alignments

Addressing   4.NF.A.1

Student-facing Task Statement

For each problem, explain or show your reasoning. Use a number line, if it helps.

1. Name a fraction that is equivalent to $\frac{9}{10}$.

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2. Is $\frac{8}{5}$ equivalent to $\frac{15}{10}$?

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Student Responses

Sample responses:

- $\frac{18}{20}$, $\frac{36}{40}$, or $\frac{90}{100}$. (If using a number line, students may partition it into tenths, and further partition each tenth into 2 parts to get twentieths or into 10 parts to get hundredths. Or they may group every 2 tenths to make 5 fifths.)

- No. Sample reasoning: One fifth is 2 tenths, so 8 fifths must be 8×2 or 16 tenths, not 15 tenths. (If using a number line, students may show fifths, partition into 2 tenths each, and see 8 fifths as equal to 16 tenths.)