Lesson 13: Area and Properties of Operations

Standards Alignments

Addressing   5.NF.B.4, 5.NF.B.4.b, 5.OA.A, 5.OA.A.1

Teacher-facing Learning Goals

- Represent the decomposition of a rectangle with diagrams and expressions.

Student-facing Learning Goals

- Let's write expressions to represent the area of rectangles.

Lesson Purpose

The purpose of this lesson is for students to analyze area diagrams and use the properties of operations to represent the area of rectangles.

In previous lessons, students applied what they know about multiplication of whole numbers and fractions to decompose a rectangle to find its area. In this lesson, students use the properties of operations to represent the area of rectangles with expressions. As students go through the activities, they will apply concepts they have seen and used in earlier grades, units, and lessons, such as:

- the distributive property
- the relationship between fractions and division
- the relationship between multiplication and division
- the relationship between addition and subtraction

Students use diagrams and expressions to investigate the distributive property, with both addition and subtraction. The diagrams provide a way to visualize how the different expressions represent the area of a given figure. This generalizes work that students have done in earlier grades with whole numbers. Understanding how the distributive property can be represented with diagrams helps students understand the structure of expressions representing products (MP7) and generalizes what they learned in an earlier grade using whole numbers (MP8).

Access for:

♿ Students with Disabilities

- Action and Expression (Activity 2)

🌐 English Learners

- MLR8 (Activity 1)

Instructional Routines

Card Sort (Activity 1), Number Talk (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

Why is it important for students to be able to write and use different expressions to represent and find the area of rectangles?

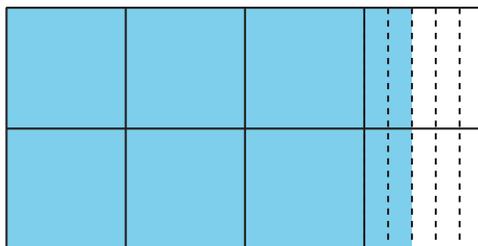# Cool-down (to be completed at the end of the lesson)   🕐 5 min

Equivalent Expressions

Standards Alignments

Addressing   5.NF.B.4.b

Student-facing Task Statement

Select **all** the expressions that represent the area of the shaded region.

A. $(2 \times 3) + \left(2 \times \frac{2}{5}\right)$

B. $6\frac{2}{5}$

C. $2 \times \left(3 + \frac{2}{5}\right)$

D. $(2 \times 4) - \left(2 \times \frac{3}{5}\right)$

E. $(2 \times 3) + \frac{2}{5}$

F. $2 \times \frac{17}{5}$

Student Responses

A, C, D, F