Teacher Created Materials
PUBLISHING

Lesson Title: Fractions in Mathematics

STEM Foundation 1: Academic Language Proficiency Mathematics Grade 5

Math Common Core State Standards
5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*
Mathematical Practices
1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively 4. Model with mathematics 5. Attend to precision 8. Look for and express regularity in repeated reasoning.

English Language Arts Common Core State Standards
ELA-Literacy.L.5.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., *however, although, nevertheless, similarly, moreover, in addition*).
ELA-Literacy.L.5.1b Form and use the perfect (e.g., *I had walked; I have walked; I will have walked*) verb tenses

Information Texts and Documents

- *Leveled Math Problems*
  - Fractional Sums – one per student
  - Student Response Form – one per student
- Fraction Strips – 3 per student

Materials

- projector
- screen
- document camera
- glue
- pencils
- construction paper
- scissors

Objectives

Students will understand and use academic and content vocabulary related to the study of fractions to understand the concept of adding fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions to solve word problems and demonstrate their learning through a visual representation.

Vocabulary

Academic vocabulary (Tier 2)—*structure*, *represents*, *display*, *order*, *model*, *combining*

Content vocabulary (Tier 3)—*fraction*, *common denominator*, *numerator*, *denominator, addend, equivalent fraction*

Procedures

BUILDING BACKGROUND

1. Activate prior knowledge by conducting a **Think Aloud** of how to use a fraction strip to add fractions with like denominators. Use words such as *common denominator*, *numerator*, *combining*, *fraction*, *addition*, and *represents*. Show students that adding 1/3 (one-third) and 2/3 (two-thirds) we get one whole fraction bar. Be mindful not to model saying one over three or two over three, but rather the proper mathematical language.
2. Review the terms used (*common denominator*, *numerator*, *combining*, *fraction* and *addition*). Write the students' understandings of the terms on a chart paper next to each term.
3. Now explain to students that sometimes we add or subtract fractions together that have different denominators, such as 2/4 + 1/2. Show these two fractions on the fraction strips. Ask students to use their fraction strips to explain how the denominators are different?
4. Explain that the fraction strip for each of the addends have a different number of parts. In order to add or subtract fractions with different denominators, we need to find an equivalent fraction with a common denominator (same number of parts in the whole) to replace one of the addends.

- Now explore the concept of an equivalent fraction. Have students repeat the term *equivalent fraction.* Break apart the words in the terms and discuss the meaning of each term equivalent *(the same as)* and fraction *(a portion of the whole)*. Then combine the meanings to construct the definition for equivalent fraction.
- Have students shade ½ on their fraction strip. Ask students the following
    - **a.** What does the one and the two represent in the fraction 1/2?

5. Next have students shade 2/4.
    - **a.** What does the two and the four represent in the fraction 2/4?
    - **b.** How does the shaded area for 2/4 compare to the shaded area for 1/2?

c. If the area of the shaded area is the same for ½ and 2/4, what can we conclude about the fractions 1/2 and 2/4? How do we know these fractions are equivalent?

6. Have students use their fraction strips to find three equivalent fractions.

GUIDED PRACTICE

1. Challenge students to model the sum of 2/3 and 3/4 using the fraction strips. Model how to use fraction strips to add the fractions. Then provide another set of fractions to add.
2. Display the first word problem (circle symbol) on *Fractional Sums* from Leveled Math Problems, page 75 on the document camera. Have students read the problem independently. Chorally read the problem.
3. Deconstruct the word problem with the students, highlighting the language to help them understand the problem context and the operation(s) to be used.
4. Work through the problem with the students.

STRUCTURED PRACTICE

1. With a partner, have the class complete the second word problem (square symbol) on *Fractional Sums* from Leveled Math Problems, page 75 using their fraction strips.

INDEPENDENT PRACTICE

1. Have students complete the Student Response Form (page 132 from *Leveled Math Problems*).

LESSON CLOSURE

1. **Jeopardy Strategy** Team game of review of vocabulary.
    a. Display 9 cards with definitions or visual representations of key vocabulary. One card at time, ask students to guess what the card represents. Ask students to put their answer in the form of a question. For example, if a card displayed 6/12 the student would say, "What is a fraction?"
2. Whole class debrief: one question at a time, ask students to think-pair-share their answers to the following questions. Between each question, do a whole group share out of some of the student's ideas.
    a. What did you notice about the denominator when you added fraction values?
    b. How does the numerator change when a common denominator is found?
    c. What information does the denominator give?