Summary

Students extend previous knowledge of adding and subtracting fractions with like denominators to adding and subtracting fractions with unlike denominators. They will also learn to assess the reasonableness of answers by estimating sums and differences to the nearest half or whole number using benchmark numbers.

Common Core Standard(s)

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.

5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Duration

Two 45-minute classroom periods
Engage and Explore, Explain, Elaborate page 1—one 45-minute classroom period
Elaborate page 2, Evaluate—second 45-minute classroom period

Materials

Fraction strips
Engage students by activating prior knowledge of adding and subtracting fractions with like denominators and of equivalent fractions.

Post the following problem on the board and ask students to solve it. Ask for a volunteer to share their solution.

\[ \frac{2}{8} + \frac{1}{8} = ? \]

Students have built a foundation with fraction concepts by now and should be able to add or subtract with like denominators, knowing that when denominators are the same the numerators are added. Emphasize that what we have done is add two eighths with one eighth to get three eighths.

Next, write the following equation on the board:

\[ \frac{1}{4} + \frac{1}{8} = ? \]

Ask students if this problem can be solved by simply adding the numerators. Have students model the addition using fraction strips and compare the model to two possible solutions, \( \frac{2}{4} \) and \( \frac{2}{8} \). Have students discuss their comparisons and recognize that the strategy of adding fractions with unlike denominators by adding the numerators does not yield the correct answer. They need a new strategy to find the sum.

Next, post the following problem on the board and ask students to solve it. Ask for a volunteer to share their solution.

\[ \frac{3}{5} - \frac{1}{5} = ? \]

Students should subtract the fractions with like denominators by subtracting the numerators.

Next, write the following problem on the board:

\[ \frac{3}{5} - \frac{2}{10} = ? \]

Ask students if this problem can be solved by simply subtracting the numerators. Have students model the subtracting using fraction strips and compare the model to two possible solutions: \( \frac{1}{5} \) and \( \frac{1}{10} \). Have students discuss their comparisons and recognize that the strategy of subtracting fractions with unlike denominators by subtracting the numerators does not yield the correct answer. They need a new strategy to find the difference.

Explain to students that in today’s lesson, we will learn how to add and subtract fractions with unlike denominators by using equivalent fractions. We can rewrite one or both fractions so that we have a common denominator. Tell them we will also look at ways to predict the answer or evaluate the reasonableness of our answers using benchmark numbers like 0, \( \frac{1}{2} \), and 1 as well as familiar fractions such as \( \frac{1}{4} \) and \( \frac{3}{4} \).
Direct students to use their new understanding to complete the practice problem worksheets. Page 1 contains bare mathematical problems to solidify understanding of the process. Page 2 contains application problems for students to apply the process to solve real-world problems.

Have students gather in groups of 2 or 4 to compare and discuss their answers to the problems. Allow students enough time to communicate with their peers about their process and their thinking. Encourage students to use correct mathematical language when discussing their process. Have each group choose two questions they want more information about, or they want to discuss as a class.

When groups are ready, take questions from students. Encourage groups to answer questions brought up by other groups.

Students can play the online Kahoot! quiz game located below the video. It provides downloadable scores at the end of the quiz game. Alternatively, you can use the paper quiz, or the exit ticket questions. All these resources are located below the video in the assessment section.