

Part I: Building understanding of Addition and subtraction of fractions

In this activity as a group you will:

- a) Write three addition problems. (See below)
- b) Solve each of the three problems using models, unit fraction reasoning, and common denominators.
- c) Make a group poster that includes your solutions to your three problems.
- d) Make a second poster with any observations and patterns that you see in your solutions to each problem and across each problem.

The addition problems must have:

- a) One with common denominators; (e.g., $\frac{1}{8} + \frac{5}{8} =$)
- b) One in which one denominator is a multiple of the other (e.g., $\frac{3}{4} + \frac{5}{12} =$); and
- c) One in which the denominators are not factors or multiples of each other (e.g., $\frac{3}{4} + \frac{3}{5} =$).

Part II: The CCSS and Addition and Subtraction of Fractions

Below find the CCSS addition and subtraction standards for grades 4 and 5. Read through each standard. Think about how the standards are related to the activity that we just completed. Identify any questions that you have about the standards.

Build fractions from unit fractions.

CCSS.Math.Content.4.NF.B.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.

- **CCSS.Math.Content.4.NF.B.3a** Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- **CCSS.Math.Content.4.NF.B.3b** Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples:* $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.
- **CCSS.Math.Content.4.NF.B.3c** Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
- **CCSS.Math.Content.4.NF.B.3d** Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

Use equivalent fractions as a strategy to add and subtract fractions.

CCSS.Math.Content.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, $a/b + c/d = (ad + bc)/bd$.)

CCSS.Math.Content.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. *For example, recognize an incorrect result* $2/5 + 1/2 = 3/7$, *by observing that* $3/7 < 1/2$.