

5th Grade - Unit 4

Addition & Subtraction of Fractions

In this unit, students build on earlier work with equivalent fractions and decimals to add and subtract fractions with unlike denominators. They will move from concrete examples (paper strips and fraction tiles) to abstract skills (writing their own math sentences). By the end of the unit, students will fluently work through multi-step word problems that contextualize their learning.

Key Words

Denominator - show the fractional unit, e.g. the fifths in 3 fifths.

Numerator - shows how many fractional unit there are, e.g. 3 in 3 fifths.

Like Denominators - fractions with the same denominator.

Unlike Denominators - fractions with different denominators.

Equivalent Fractions - fractions that have the same value, though they may look different.

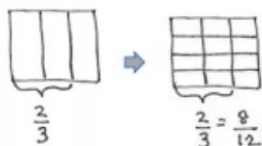
Improper Fractions - fractions where the numerator is greater than the denominator.

Mixed Numbers - fractions made up of a whole number and a fraction.

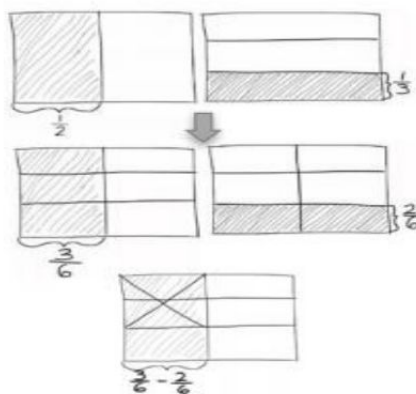
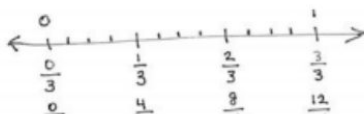
Simplest Form - a fraction is written in simplest form when the greatest common factor of the numerator and denominator is 1.

Sum - the answer to an addition problem.

Difference - the answer to a subtraction problem.



Both the area model and number line show the equivalent fractions of $\frac{2}{3}$ and $\frac{8}{12}$.



Subtraction with unlike denominators:

$$\frac{1}{2} - \frac{1}{3} = \frac{3}{6} - \frac{2}{6} = \frac{1}{6}$$

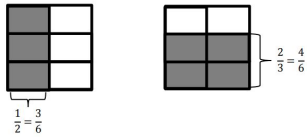
How can I help at home?

- ★ Ask your child what they learned in school and ask them to show you an example.
- ★ Look for opportunities in daily life to discuss fractional parts of a whole, e.g. pieces of pizza, parts of a hour, distances to familiar places
- ★ Discuss the difference between improper fractions and mixed numbers.
- ★ Bake together and talk about how much of each ingredient you need if you were to double or triple the recipe.

Common Core Standards

- ★ Use equivalent fractions as a strategy to add and subtract fractions
 - Add and subtract fractions with unlike denominators
 - Solve word problems involving addition and subtraction of fractions

Marco bought two pizzas for dinner. He ate $\frac{1}{2}$ of the pizza for dinner and $\frac{2}{3}$ for breakfast the next morning. Marco took the remaining pizza to school for lunch. How much total pizza did he eat for breakfast and lunch? How much pizza did Marco take to school for lunch?



$\frac{7}{6}$ is an improper fraction

$\frac{7}{6}$ is the same as $\frac{6}{6} + \frac{1}{6}$

$\frac{6}{6}$ is equal to a whole

$1 + \frac{1}{6} = 1\frac{1}{6}$ } Mixed Number

Marco ate a total of one whole pizza and one-sixth of the second pizza for dinner and breakfast.

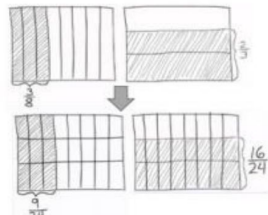
Question 2: How much pizza did Marco take for lunch?

Strategy 1: $\frac{1}{6} + \frac{5}{6} = 1$ whole pizza $\frac{1}{6} + \frac{5}{6} = 1$ whole pizza

Strategy 2: 1 whole pizza - $\frac{1}{6}$ pizza eaten = $\frac{5}{6}$

Marco took five-sixths of a pizza to school for lunch.

Sample Problems & Models

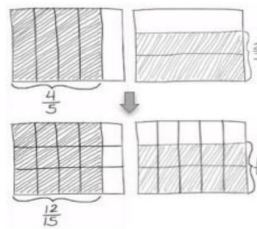


Below is an area model drawing of $\frac{4}{5} - \frac{2}{3}$. Note that the final answer would be found by doing the simple subtraction problem:

$$\frac{12}{15} - \frac{10}{15} = \frac{2}{15}$$

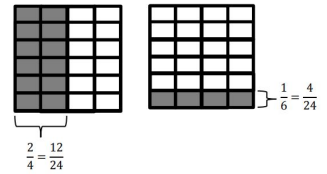
Above is an area model drawing of $\frac{3}{8} + \frac{2}{3}$. Note that the final answer would be found by doing the simple addition problem:

$$\frac{9}{24} + \frac{16}{24} = \frac{25}{24} = 1\frac{1}{24}$$



For the following problem, draw a picture using rectangular models.

$$\frac{2}{4} + \frac{1}{6} =$$



$$\frac{12}{24} + \frac{4}{24} = \frac{16}{24} = \frac{2}{3}$$

The fraction $\frac{16}{24}$ can be simplified to $\frac{2}{3}$. The only common factor for 2 and 3 is 1; therefore it is in simplest form.

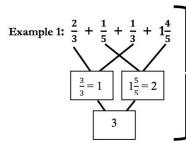
To find the simplest form we divide both the numerator and denominator by a common factor.

Example 1: $\frac{16}{24} \div \frac{8}{8} = \frac{2}{3}$ $\frac{8}{8} = 1$ $\frac{2}{8} = \frac{1}{4}$ $\frac{2}{4} = \frac{1}{2}$ $\frac{1}{2} = \frac{1}{2}$

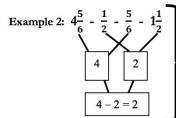
Example 2: $\frac{16}{24} \div \frac{4}{4} = \frac{4}{6}$ $\frac{4}{4} = 1$ $\frac{2}{6} = \frac{1}{3}$ $\frac{2}{3} = \frac{2}{3}$

Example 3: $\frac{16}{24} \div \frac{8}{8} = \frac{2}{3}$

Strategize to solve an addition or subtraction problem involving more than 2 fractions and/or mixed numbers.



This problem is adding thirds and fifths. The most efficient approach would be to first add the like units together. Then combine the sums.



In this problem we are subtracting $\frac{1}{2}$, $\frac{5}{9}$ and $\frac{1}{2}$ from $4\frac{5}{6}$. We begin by subtracting $\frac{5}{9}$ from $4\frac{5}{6}$. Now you don't subtract $\frac{1}{2}$ from $1\frac{2}{3}$. Remember we are subtracting both $\frac{1}{2}$ and $\frac{1}{2}$ from what is left. So we add $\frac{1}{2}$ and $1\frac{1}{2}$. The sum of 2 is subtracted from the 4.

A Problem to Try at Home

Jing spent $\frac{1}{3}$ of her money on a pack of pens, $\frac{1}{2}$ of her money on a pack of markers, and $\frac{1}{6}$ of her money on a pack of pencils. Draw a model to determine what fraction of her money is left.

Coming Up Next...

Students will learn to multiply fraction and decimal fractions and start work with fraction division. Students will begin by using fraction tiles as a concrete way to understand fraction operations and eventually move to more abstract understanding.