Grade 5, Module 3: Addition and subtraction of fractions

What is this module about? In this 16-lesson module, 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 number lines) to abstract skills (writing their own math sentences). By the end of the module, students will fluently work through multi-step word problems that contextualize their learning.

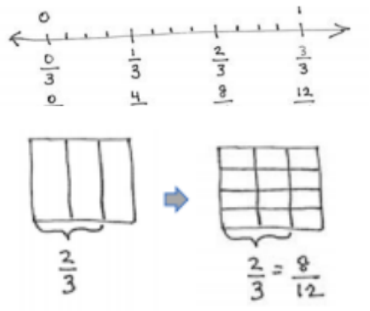
What came before this module? We worked to build our knowledge of multiplication and division of whole numbers and decimals.

What comes after this module? In Module 4, we will extend our understanding of fraction operations to multiplication and division of both fractions and decimal fractions.

How can you help at home?

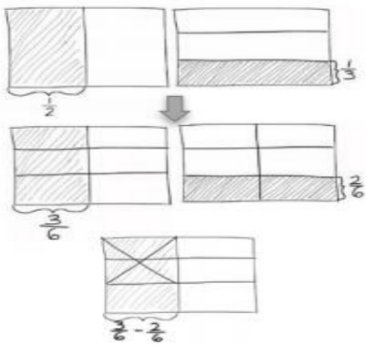
- Look for opportunities in daily life to discuss fractional parts of a whole, e.g., pieces of pizza, parts of an hour, distance to familiar places
- Continue to practice and review multiplication and division math facts—this greatly supports work with fractions!

Both the area model and number line show the equivalent fractions of $^{2}/_{3}$ and $^{8}/_{12}$.



Subtraction with unlike denominators.

$^{1}/_{2} - {}^{1}/_{3} = {}^{3}/_{6} - {}^{2}/_{6} = {}^{1}/_{6}$



Key Words and Ideas in this Module

- **Denominator**: shows the fractional unit, e.g., the fifths in $^{3}/_{5}$
- **Numerator**: shows how many fractional units there are, e.g., the three in $^{3}/_{5}$
- **Benchmark fraction**: a very familiar fraction that can be referred to for comparison questions
- **Like denominators**: fractions with the same denominators, e.g., $^{1}/_{8}$ and $^{3}/_{8}$
- **Unlike denominators**: fractions with different denominators, e.g., $^{1}/_{8}$ and $^{1}/_{7}$
- **Equivalent fractions**: fractions with same value, though they may look different, e.g., $^{3}/_{5}$ and $^{6}/_{10}$

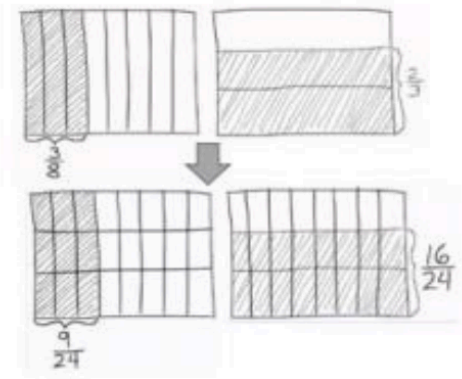
Key Standards in this Module

- Use equivalent fractions as a strategy to add and subtract fractions (add and subtract fractions with unlike denominators and solve word problems involving addition and subtraction of fractions)

Spotlight on Math Models

Area Models

You will often see this mathematical representation throughout the curriculum. Students began in earlier grades to build arrays for various purposes, first showing simple multiplication. In Grade 5, we move beyond using the area model for multiplication of whole numbers and begin to use this powerful model to illustrate mathematical operations on fractions. One of the goals is to first give students concrete experiences with mathematical concepts, and then to build slowly toward more abstract representations of those concepts. The area model is a tool that helps students to make that important leap, and will support students' learning through algebra and beyond.

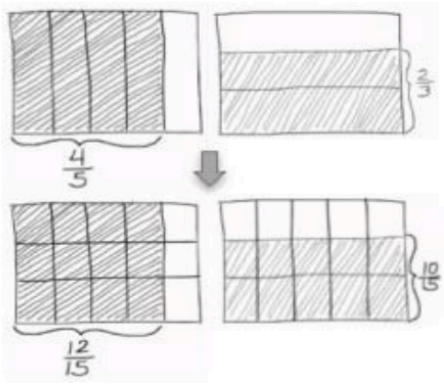


Above is an area model drawing of $\frac{3}{8}+\frac{2}{3}$. Note that the final answer would be found by doing the simple addition problem:

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

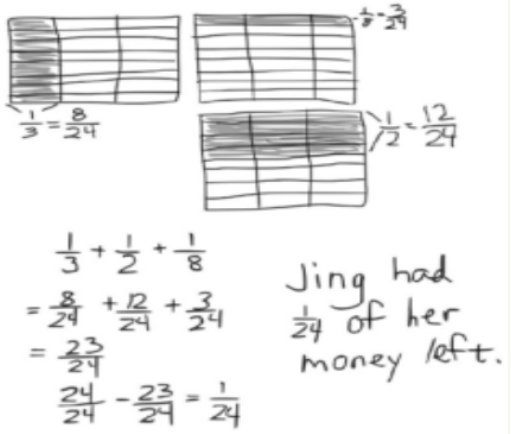
Below is an area model drawing of $\frac{4}{5}-\frac{2}{3}$. Note that the final answer would be found by doing the simple subtraction problem:

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



Sample problem from Module 3 (Lesson 7)

Jing spent $^1/_3$ of her money on a pack of pens, $^1/_2$ of her money on a pack of markers, and $^1/_8$ of her money on a pack of pencils. What fraction of her money is left?



The student here has illustrated the equivalent fractions to $^1/_3$, $^1/_2$ and $^1/_8$, using the like denominator of twenty-fourths. Then, in two steps, she adds those equivalent fractions, and subtracts that total from $^{24}/_{24}$ to find the solution.