


 Chapter  
3

## Addition and Subtraction of Unlike Fractions

In *Primary Mathematics (Standards Edition) Textbook 4A*, students learned to add or subtract like or related fractions. **Like fractions** are fractions where the denominators are the same. **Related fractions** are fractions where the denominator of one fraction is a simple multiple of the denominator of the other fraction. Addition and subtraction will involve finding an equivalent fraction of only one of them. E.g.,  $\frac{3}{4} + \frac{1}{8} = \frac{6}{8} + \frac{1}{8} = \frac{7}{8}$ .

In this chapter students will learn to add and subtract **unlike fractions** where the denominator of one is not a simple multiple of the denominator of the other. So addition and subtraction will involve finding equivalent fractions of both. E.g.,  $\frac{3}{8} + \frac{5}{6} = \frac{9}{24} + \frac{20}{24} = \frac{29}{24} = 1\frac{5}{24}$ .

In this example, the equivalent fractions have a denominator that is the least common multiple of both 8 and 6. Of course, any equivalent fractions where the denominators are the same can be used, such as the product of the denominators of each fraction. In that case, equivalent fractions can be obtained by multiplying the numerator and denominator of each fraction by the denominator of the other fraction:

$$\frac{3}{8} + \frac{5}{6} = \frac{3 \times 6}{8 \times 6} + \frac{5 \times 8}{6 \times 8} = \frac{18}{48} + \frac{40}{48} = \frac{58}{48} = \frac{29}{24} = 1\frac{5}{24}$$

Students should reduce answers to the simplest form. Answers that are improper fractions do not necessarily have to be converted to proper fractions. In high school, students will learn that it is better to keep intermediate answers as improper fractions. At this stage, however, students can visualize mixed numbers more easily than improper fractions, so you may want to require your students to convert all answers to proper fractions or mixed numbers.

The least common multiple of the denominators is also called the least common denominator.

Students should realize that in order to add or subtract fractions, they need to have the same denominator, but any common denominator can be used. Multiplying the two denominators together always gives a common denominator, but finding the least common denominator makes the computation easier and reduces the amount of simplification required to find the simplest term for the answer. (In later grades students will be adding and subtracting fractional algebraic expressions, where using the least common denominator will simplify the problem significantly).