<div style="border:1px solid">

(chapter 3) **Addition and Subtraction of Unlike Fractions**

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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., $\dfrac{3}{4} + \dfrac{1}{8} = \dfrac{6}{8} + \dfrac{1}{8} = \dfrac{7}{8}$.

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., $\dfrac{3}{8} + \dfrac{5}{6} = \dfrac{9}{24} + \dfrac{20}{24} = \dfrac{29}{24} = 1\dfrac{5}{24}$.

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).

Lesson 4.4b	**Dividing a Fraction by a Unit Fraction**

Objectives	California Standards
• Divide a fraction by a unit fraction.	**NS 2.2**: Demonstrate proficiency with division, including division with positive decimals and long division with multidigit divisors. **NS 2.4**: Understand the concept of multiplication and division of fractions. **MR 2.2**: Apply strategies and results from simpler problems to more complex problems. **MR 2.3**: Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.

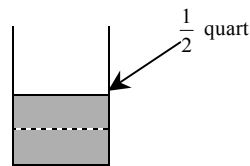| Teaching Strategies		
Illustrating division of a fraction by a unit fraction when the answer is a whole number	Ask students what fraction of a quart a cup is. There are 4 cups in a quart, so a cup is $\frac{1}{4}$ of a quart. Tell students you have half of a quart of juice and want to divide it into cups. Each cup is $\frac{1}{4}$ of a quart, so you are dividing $\frac{1}{2}$ quart by $\frac{1}{4}$ quart. Draw a picture of a container and mark $\frac{1}{2}$ quart on the container. How many cups will you need? Students should be able to tell you intuitively that you need 2 cups. There are 2 cups, or two $\frac{1}{4}$ quarts in $\frac{1}{2}$ quart.	$\frac{1}{2} \div \frac{1}{4} = 2$ $\frac{1}{2}$ quart $\frac{1}{2} \times 4 = 2$
	Write $\frac{1}{2} \times 4$ and ask students to solve the problem. Point out that we get the same answer as we did with $\frac{1}{2} \div \frac{1}{4}$. To divide $\frac{1}{2}$ by $\frac{1}{4}$, we can multiply $\frac{1}{2}$ by its reciprocal, 4.	$\frac{1}{2} \times 4 = 2$ $\frac{1}{2} \div \frac{1}{4} = \frac{1}{2} \times 4 = 2$
	Discuss **task 6**, **Textbook p. 93**. Ask students to illustrate these problems with bars.	Textbook p. 93 6. (a) $\frac{2}{3} \div \frac{1}{3} = \frac{2}{\cancel{3}_1} \times \cancel{3}^1 = \boxed{2}$ (b) $\frac{2}{3} \div \frac{1}{6} = \frac{2}{\cancel{3}_1} \times \cancel{6}^2 = \boxed{4}$

Lesson	Objectives	Materials	Resources	Standards
Chapter 3 : Area of a Triangle				**4 days**
5.3a Area of a Triangle	• Compare the area of a triangle with the area of its related rectangle. • Identify that the area of a triangle is half the area of the rectangle sharing the same base and vertical height. • Identify the height of given triangles related to the given base. • Use formula to find the area of triangles – $\frac{1}{2}$ × base × height.	• Square Grids	TB: p. 115-118 WB: p. 109-112	MG 1.1 MR 2.2 MR 2.3 MR 2.4 MR 3.2
5.3b Area of a Triangle	• Realize that different triangles sharing the same base and height have the same area. • Find the area of a triangle with given base and height.		TB: p. 119 WB: p. 113-115	MG 1.1
5.3c Area of a Triangle	• Identify the base and height of given triangles and use the formula ½ × base × height to find the area. • Use $\frac{1}{2}$ × base × height to find the area of the shaded triangle related to a given rectangle. • Find the area of the shaded part of a rectangle by subtracting the area of triangles.	• Square Grids	TB: p. 120-121 WB: p. 116-118	MG 1.1
5.3d Practice B	• Practice concepts learned in Chapters 1, 2 and 3.		TB: p. 122 EP: p. 109-112 Tests: p. 183-190	MG 1.1