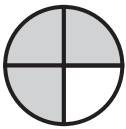## ◆ Basic Fractions

# Overview of Skill Development

Concept of Fractions

Basic Fractions teaches what the numbers in a fraction tell. The bottom number tells how many parts in each whole, and the top number tells how many parts are used.

In the fraction $\dfrac{3}{4}$, there are 4 parts in each whole, and 3 parts are used.

Students are shown how to apply these rules in exercises that require them to fill in the numbers to represent a picture and in exercises that require them to write a diagram that represents a numerical fraction. Exercises include diagrams showing fractions that
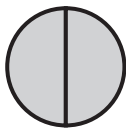
◆ equal less than 1 whole
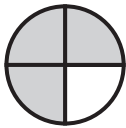
$$\frac{3}{4} \qquad \frac{2}{3}$$
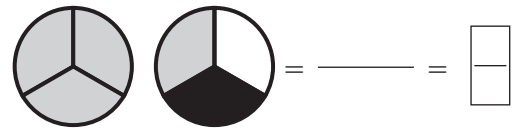
◆ equal 1 whole

$$\frac{2}{2} \qquad \frac{5}{5}$$

◆ equal more than 1 whole

$$\frac{5}{3}$$

Operations on Fractions

The modules present visual demonstrations of what happens when fractions are added. The initial exercises presenting adding fractions with like denominators show diagrams like this:

$$= \text{———} = \boxed{\frac{}{}}$$

The students write 3 on the bottom because there are 3 parts in each whole. Then they write the 4 + 1 on the top. The 4 represents the 4 shaded parts, and the 1 represents the dotted part. The students then add the 4 + 1 and write 5. The solved problem looks like this:
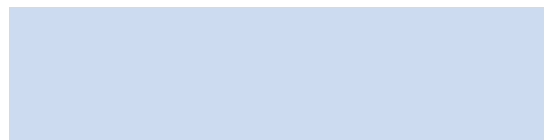
$$= \frac{4 + 1}{3} = \boxed{\frac{5}{3}}$$
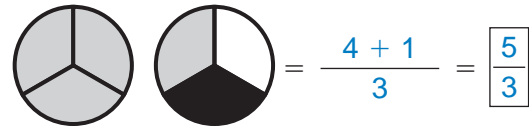
There are no diagrams in the next exercise. The students are shown problems such as this:
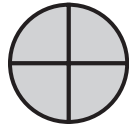
$$\frac{3}{4} + \frac{2}{4} = \text{———} = \boxed{\frac{}{}}$$

The student writes

$$\frac{3}{4} + \frac{2}{4} = \frac{3 + 2}{4} = \boxed{\frac{5}{4}}$$

Worksheet exercises include several addition

$$\bigoplus = \frac{8}{4}$$

Later, students learn to tell how many wholes a fraction equals by determining how many times bigger the top number is than the bottom number of a fraction. If the top number is 2 times bigger, the fraction equals 2 wholes. If the top number is 6 times bigger, the fraction equals 6 wholes. The following is part of an exercise from Lesson 42.

C S
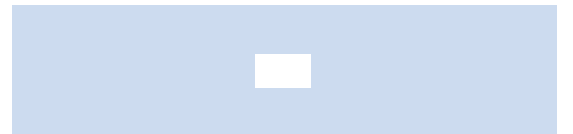
pan in Fractions

a. (Write on the board:)

$$2 \quad =$$
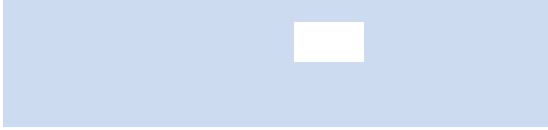
b. We're going to change this mixed number into a fraction.

• (Point to the .)

• The bottom number of the fraction tells us

The initial exercises in which students are asked to find a missing number in an equivalent fraction are written in this form:

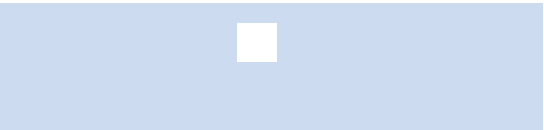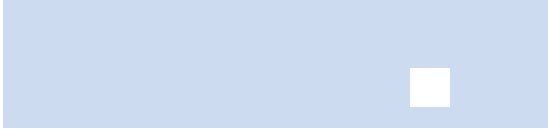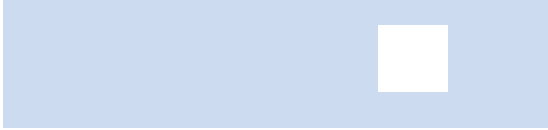$$\frac{4}{5} \times \left(\quad\right) = \frac{}{15}$$

The students will write a fraction equal to 1 in the parentheses. The equal sign indicates that we must end with an amount that equals the amount we start with. We must multiply $\frac{4}{5}$ by a fraction that equals 1. The students first figure out what number the denominator of the first fraction must be multiplied by to end up with the denominator of the second fraction. Five times what number equals 15? The answer is 3. The denominator of the fraction we're multiplying $\frac{4}{5}$ by is 3. Because we must multiply by a fraction that equals 1, the top number must also be 3. A fraction equals 1 when the top and the bottom numbers are the same. The students write $\frac{3}{3}$ in parentheses and then multiply the numerator of the initial fraction and the numerator of the fraction that equals 1 whole. The answer is 12.

$$\frac{4}{5} \times \left(\quad\right) = \frac{12}{15}$$

Scope and Sequence Chart

Basic Fractions

Skill	1	5	10	15	20	25	30	35	40	45	50	55
Determine the number of parts in a whole.	T	R	R	R	R	R	R	R	R	R	R	R
Represent denominators with pictures.	T	R	R	R	R	R	R	R	R	R	R	R
Determine the number of parts used.	T	T	R	R	R	R	R	R	R	R	R	R
Identify the fractions represented by pictures.		T	R	R	R	R	R	R	R	R	R	R
Name fractions.		T	T	R	R	R	R	R	R	R	R	R
Represent fractions with pictures.		T	T	R	R	R	R	R	R	R	R	R
Identify fractions equal to 1 from pictures.			T	R	R	R	R	R	R	R	R	R
Identify fractions as more, less, equal to 1.				T	R	R	R	R	R	R	R	R
Complete fractions equal to 1.				T	R	R	R	R	R	R	R	R
Identify the missing number in an addition or subtraction problem involving fractions with common denominators.				T	R	R	R	R	R	R	R	R
Write addition and subtraction problems from representations of fractions.				T	R	R	R	R	R	R	R	R
Rewrite fractions with common denominators that are added or subtracted. Do not reduce sum or difference.					T	R	R	R	R	R	R	R
Write whole numbers as fractions.					T	R	R	R	R	R	R	R
Multiply two fractions. Do not reduce product.						T	R	R	R	R	R	R
Multiply a whole number by a fraction. Do not reduce product.							T	R	R	R	R	R
Add or subtract column problems with common denominators.								T	R	R	R	R
Multiply by 1.									T	T	R	
Reduce fractions to whole numbers.										T	R	
Expand mixed numbers to fractions.										T	R	
Generate a series of fractions equal to 1.											T	
Complete equivalent fraction equations.												T

Key: Teach ▬▬▬▬▬   Review ▬▬▬▬