

# Fractions Lesson 3

## Simple Fractions

### with a Diagonal Fraction Line

## Important Note

For all braille examples, emboss the "L3-Fractions-Problems-Only.brf" file as a supplement to this lesson.

## Background

After you completed "Lesson 1 Simple Fractions," you could write a simple fraction with a horizontal fraction line in Nemeth Code. However, fractions may also be displayed in print with the numerator to the left of a diagonal line, or slash, and the denominator to the right. There are actually two different ways these particular types of fractions can be written in print, and therefore there are two different ways to write them in Nemeth Code. We will learn how to write both, one way at a time.

## Basic Rules – Method 1

A simple fraction with a diagonal fraction line where the numerator appears to be raised higher than the denominator, uses the same opening simple fraction indicator and closing simple fraction indicator, but it takes two cells to write a diagonal fraction line in Nemeth Code. Basically, the diagonal fraction line is written with dots 4-5-6 in the first cell, followed by dots 3-4 (the horizontal fraction line) in the second cell.

To summarize, this type of fraction with a diagonal fraction line uses the following Nemeth symbols:

- Opening simple fraction indicator (dots 1-4-5-6) ⠠
- Diagonal fraction line (dots 4-5-6, dots 3-4) ⠠⠨
- Closing simple fraction indicator (dots 3-4-5-6) ⠡

The following steps outline how to write the simple fraction 1 over 8 in Nemeth Code:

1. Opening simple fraction indicator (dots 1-4-5-6) ⠠
2. One (dot 2) ⠠

3. Diagonal fraction line (dots 4-5-6, dots 3-4)    ⋮⋮
4. Eight (dots 2-3-6)    ⋮
5. Closing simple fraction indicator (dots 3-4-5-6)    ⋮

$$\frac{1}{8}$$

Notice that the numerator of 1 is to the left of the diagonal fraction line, and the denominator of 8 is to the right.

## Examples for Method 1

1. three over four or three-fourths

$$\frac{3}{4}$$

2. five over eight or five-eighths

$$\frac{5}{8}$$

3. thirty-three over one hundred or thirty-three hundredths

$$\frac{33}{100}$$

## Activity Time for Method 1

Write the fractions from Examples 1 to 3 using Method 1:

1. three over four or three-fourths
2. five over eight or five-eighths
3. thirty-three over one hundred or thirty-three hundredths

## Examples for Method 1 with Variables

The numerator and denominator don't always have to be a specific number. We could have an unknown number in either the numerator or the denominator or both. These unknown numbers are written as letters called **variables**.

1. three over y or open fraction three over y close fraction

$$\frac{3}{y}$$

Figure 1 shows a 3x6 grid of dot patterns. The first two columns show a 3x3 grid of dots with the top-right dot missing. The next two columns show a 3x3 grid of dots with the top-right dot missing and the middle-right dot filled. The last two columns show a 3x3 grid of dots with the top-right dot missing and the middle-right dot filled, with the bottom-right dot also filled.

2.  $x$  over  $y$  or open fraction  $x$  over  $y$  close fraction

$$\frac{x}{y}$$

## Activity Time for Method 1 with Variables

Write the fractions with variables from Examples 1 and 2 using Method 1:

1. three over y or  $\frac{3}{y}$
2. x over y or  $\frac{x}{y}$

## Basic Rules – Method 2

Different rules apply if the numerator and denominator are printed at the same level and the size of print is the same as the surrounding math expressions. In this situation, simple fraction indicators are not used. Instead, when writing this type of fraction, you would write the numeric indicator, the numerator, the diagonal fraction line, and end with the denominator. There is no need for any type of closing fraction indicator.

To summarize, this type of fraction with a diagonal fraction line uses the following Nemeth symbols:

- Numeric indicator (dots 3-4-5-6) ⋮
- Diagonal fraction line (dots 4-5-6, dots 3-4) ⋮⋮

The following steps outline how to write the simple fraction 1 over 8 in Nemeth Code:

1. Numeric indicator (dots 3-4-5-6) ⠼
2. One (dot 2) ⠠
3. Diagonal fraction line (dots 4-5-6, dots 3-4) ⠨
4. Eight (dots 2-3-6) ⠠

1/8

⠼⠠⠨⠠

Notice that the numerator of 1 is to the left of the diagonal fraction line, and the denominator of 8 is to the right.

## Examples for Method 2

1. three over four or three-fourths

3/4

⠼⠠⠨⠠

2. five over eight or five-eighths

5/8

⠼⠠⠨⠠

3. thirty-three over one hundred or thirty-three hundredths

33/100

⠼⠠⠨⠠

## Activity Time for Method 2

Write the fractions from Examples 1 to 3 using Method 2:

1. three over four or three-fourths
2. five over eight or five-eighths
3. thirty-three over one hundred or thirty-three hundredths

## Examples for Method 2 with Variables

The numerator and denominator don't always have to be a specific number. We could have a variable in either the numerator or the denominator or both.

1. three over y or open fraction three over y close fraction

 $3/y$ 

2.  $\frac{x}{y}$  or open fraction  $x$  over  $y$  close fraction

 $x/y$ 

## Activity Time for Method 2 with Variables

Write the fractions with variables from Examples 1 and 2 using Method 2:

1. three over y or  $\frac{3}{y}$
2. x over y or  $\frac{x}{y}$