

Fractions Lesson 2

Simple Fractions

with Signs of Operation and Comparison

Important Note

For all braille examples, emboss the "L2-Fractions-NV-Problems-Only.brf" file as a supplement to this lesson.

Background

After completing "Lesson 1 Simple Fractions," you are ready to learn how to use simple fractions with signs of operation and comparison in a linear format.

As a quick review, fractions with a horizontal fraction line use the following Nemeth symbols:

- Opening simple fraction indicator (dots 1-4-5-6) ⠠
- Horizontal fraction line (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. Horizontal fraction line (dots 3-4) ⠬
4. Eight (dots 2-3-6) ⠠
5. Closing simple fraction indicator (dots 3-4-5-6) ⠡






⠠⠠⠬⠠⠠

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

Basic Rules with Signs of Operation

In this lesson, we will first learn how to write problems that contain simple fractions with one of the four basic operation signs: addition, subtraction, multiplication, and division.

The four basic operations use the following Nemeth symbols:

- Plus sign (dots 3-4-6) (+) 
- Minus sign (dots 3-6) (−) 
- Multiplication cross (dot 4, dots 1-6) (×) 
- Multiplication dot (dots 1-6) (·) 
- Division (divided by) sign (dots 4-6, dots 3-4) (÷) 

When writing a problem that contains two simple fractions with an operation sign between them, you would write the first fraction, immediately followed by the operation sign, immediately followed by the second fraction as one continuous flow of braille cells. There would be no spaces.

Examples with Signs of Operation

1. three-fourths plus one-fourth

$$\frac{3}{4} + \frac{1}{4}$$

2. five-eighths divided by three-eighths

$$\frac{5}{8} \div \frac{3}{8}$$

3. thirty-three hundredths minus eleven-fiftieths

$$\frac{33}{100} - \frac{11}{50}$$

4. five-sevenths times (multiplication cross) seven-eighths

$$\frac{5}{7} \times \frac{7}{8}$$

5. twenty-one fiftieths times (multiplication dot) twenty-five sixty-thirds

$$\frac{21}{50} \cdot \frac{25}{63}$$

Activity Time with Signs of Operation




Write the fraction problems with signs of operation from Examples 1 to 5:

1. three-fourths plus one-fourth
2. five-eighths divided by three-eighths
3. thirty-three hundredths minus eleven-fiftieths
4. five-sevenths times (multiplication cross) seven-eighths
5. twenty-one fiftieths times (multiplication dot) twenty-five sixty-thirds

Basic Rules with Signs of Comparison

Next, we will learn how to write simple fractions using one of the three basic comparison signs: the equals sign, less than sign, and greater than sign.

These three basic comparison signs use the following Nemeth symbols:

- Equals sign (dots 4-6, dots 1-3) (=) 
- Less than sign (dot 5, dots 1-3) (<) 
- Greater than sign (dots 4-6, dot 2) (>) 

When writing two simple fractions with a sign of comparison between them, you would write the first fraction, space, the comparison symbol, space, and then the second fraction. Unlike a sign of operation, there should be a space on either side of a comparison symbol in Nemeth Code.

Examples with Signs of Comparison

1. One-third is less than two-thirds.

$$\frac{1}{3} < \frac{2}{3}$$

[illegible]

2. Four-sevenths equals twelve twenty-firsts.

$$\frac{4}{7} = \frac{12}{21}$$

The figure consists of 10 sub-diagrams arranged horizontally, each showing a 3x10 grid of dots. The dots are black, and the background is white. The pattern of dots evolves from left to right:

- Diagram 1: 3 dots in the first column (row 1, 2, 3).
- Diagram 2: 3 dots in the first column, 2 dots in the second column (row 1, 2).
- Diagram 3: 3 dots in the first column, 3 dots in the second column (row 1, 2, 3).
- Diagram 4: 3 dots in the first column, 3 dots in the second column, 2 dots in the third column (row 1, 2).
- Diagram 5: 3 dots in the first column, 3 dots in the second column, 3 dots in the third column (row 1, 2, 3).
- Diagram 6: 3 dots in the first column, 3 dots in the second column, 3 dots in the third column, 2 dots in the fourth column (row 1, 2).
- Diagram 7: 3 dots in the first column, 3 dots in the second column, 3 dots in the third column, 3 dots in the fourth column (row 1, 2, 3).
- Diagram 8: 3 dots in the first column, 3 dots in the second column, 3 dots in the third column, 3 dots in the fourth column, 2 dots in the fifth column (row 1, 2).
- Diagram 9: 3 dots in the first column, 3 dots in the second column, 3 dots in the third column, 3 dots in the fourth column, 3 dots in the fifth column (row 1, 2, 3).
- Diagram 10: 3 dots in the first column, 3 dots in the second column, 3 dots in the third column, 3 dots in the fourth column, 3 dots in the fifth column, 2 dots in the sixth column (row 1, 2).

3. Eight-ninths is greater than eighty-eight hundredths.

$$\frac{8}{9} > \frac{88}{100}$$

Figure 1 shows four 3x3 dot patterns. Pattern (a) has 6 dots. Pattern (b) has 10 dots. Pattern (c) has 5 dots. Pattern (d) has 14 dots.

Activity Time with Signs of Comparison

Write the fraction problems with signs of comparison from Examples 1 to 3:

1. One-third is less than two-thirds.
2. Four-sevenths equals twelve twenty-firsts.
3. Eight-ninths is greater than eighty-eight hundredths.

Examples with Signs of Operation and Comparison

Finally, let's take a look at a couple of fraction problems involving both a comparison sign and one or more operation signs.

1. One-fifth plus open fraction six minus two over five close fraction equals one.

$$\frac{1}{5} + \frac{6-2}{5} = 1$$

2. Sixty-three hundredths times (multiplication dot) twenty-five eighty-fourths is greater than one-sixteenth.

$$\frac{63}{100} \cdot \frac{25}{84} > \frac{1}{16}$$

Activity Time with Signs of Operation and Comparison

Write the fraction problems with signs of operation and comparison from Examples 1 and 2:

1. One-fifth plus open fraction six minus two over five close fraction equals one.
2. Sixty-three hundredths times (multiplication dot) twenty-five eighty-fourths is greater than one-sixteenth.