Simple Fractions with Signs of Operation and Comparison

Background

After completing the *1. How to Read and Write a Simple Fraction* focused lesson, 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:

 (dots 1-4-5-6) opening simple fraction indicator

 (dots 3-4) horizontal fraction line

 (dots 3-4-5-6) closing simple fraction indicator

So to write the simple fraction $\frac{1}{8}$ in Nemeth Code, you would write:

 or opening simple fraction indicator, one, horizontal fraction line, eight, closing simple fraction indicator. 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 for Writing Problems with Simple Fractions and Signs of Operation

In this lesson, we will 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:

 (dots 3-4-6) plus sign (+)

 (dots 3-6) minus sign (−)

 (dot 4, dots 1-6) multiplication cross (×)

 (dots 1-6) multiplication dot (·)

 (dots 4-6, dots 3-4) division (divided by) sign (÷)

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

1. $\frac{3}{4} + \frac{1}{4}$ three-fourths plus one-fourth

2. $\frac{5}{8} \div \frac{3}{8}$ five-eighths divided by three-eighths

3. $\frac{33}{100} - \frac{11}{50}$ thirty-three hundredths minus eleven-fiftieths

4. $\frac{5}{7} \times \frac{7}{8}$ five-sevenths times (multiplication cross) seven-eighths

Activity time: See if you can re-create the problems in examples 1 to 4.

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**. The numerator or denominator or both could also contain signs of operation.

Examples with Variables

5. $\frac{3}{y} \cdot \frac{y}{4}$

   open fraction three over y close fraction times (multiplication dot) open fraction y over four close fraction

6. $\frac{x}{y} \div \frac{x}{y}$

open fraction x over y close fraction divided by open fraction x over y close fraction

7. $\frac{x+y}{x-y} \cdot \frac{1}{x+y}$

open fraction x plus y over x minus y close fraction times (multiplication dot) one over x plus y close fraction

Activity time: See if you can re-create the problems in examples 5 to 7.

Basic Rules for Writing Problems with Simple Fractions and 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:

 (dots 4-6, dots 1-3) equals sign (=)

 (dot 5, dots 1-3) less than sign (<)

 (dots 4-6, dot 2) greater than sign (>)

When writing two simple fractions with a sign of comparison between them, you would write the first fraction, space, the comparison sign, 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

8. $\frac{1}{3} < \frac{2}{3}$ One-third is less than two-thirds.

9. $\frac{4}{7} = \frac{12}{21}$ Four-sevenths equals twelve twenty-firsts.

10. $\frac{8}{9} > \frac{88}{100}$ Eight-ninths is greater than eighty-eight hundredths.

Activity time: See if you can re-create the problems in examples 8 to 10.

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. These variables could even have **superscripts** or **exponents**. The numerator or denominator or both could also contain signs of operation. Notice in Problem 11 that we need to use the **baseline indicator** (dot 5) in order to show that the exponent has ended and that we have returned to baseline. This occurs four times: once in the numerator of both fractions (immediately before the horizontal fraction line) and once in the denominator of both fractions (immediately before the closing simple fraction indicator).

Examples with Variables

11. $\frac{4y^2}{y^2} > \frac{3x^2}{x^2}$

Open fraction four y squared over y squared close fraction is greater than three x squared over x squared close fraction.

12. $\frac{2x}{4x} < \frac{10x}{15x}$

Open fraction two x over four x close fraction is less than open fraction ten x over fifteen x close fraction.

Activity time: See if you can re-create the problems in examples 11 and 12.

Problems involving Fractions with Both Signs of Operation and Signs of Comparison

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

Examples

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

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

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

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

Examples with Variables

15. $\frac{y+1}{y+1}=\frac{y+3}{y+3}$

Open fraction y plus one over y plus one close fraction equals open fraction y plus three over y plus three close fraction.

16. $\frac{x+2}{3}-\frac{x-1}{4}<\frac{5}{12}$

Open fraction x plus two over three close fraction minus open fraction x minus one over four close fraction is less than five-twelfths.

Activity time: See if you can re-create the problems in examples 13 to 16.