

Grade Level/Course: Grades 6 – 7
Lesson/Unit Plan Name: Lost In Translation
Rationale/Lesson Abstract: In order to increase confidence with word problems, students will translate numerical expressions into mathematical expressions and translate mathematical situations into numerical expressions.
Timeframe: 90 minutes
Common Core Standard(s): 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers. 6.EE.2.a Write expressions that record operations with numbers and with letters standing for numbers. <i>For example, express the calculation “Subtract y from 5” as $5 - y$.</i>

Instructional Resources/Materials:

- matching cards (32 per pair)
- copies of Warm-Up
- copies of Ticket Out the Door

Warm-Up Debrief (master copy on page 5)

A number decreased by 10

$$\textcircled{A} + \textcircled{B} - \textcircled{C} \times \textcircled{D} \div$$

The sum of a number and 8

$$\textcircled{A} + \textcircled{B} - \textcircled{C} \times \textcircled{D} \div$$

The product of 3 and a number

$$\textcircled{A} + \textcircled{B} - \textcircled{C} \times \textcircled{D} \div$$

5 times a quantity

$$\textcircled{A} + \textcircled{B} - \textcircled{C} \times \textcircled{D} \div$$

The difference of two consecutive integers

$$\textcircled{A} + \textcircled{B} - \textcircled{C} \times \textcircled{D} \div$$

Half of a number**

$$\textcircled{A} + \textcircled{B} - \textcircled{C} \times \textcircled{D} \div$$

The quotient of a number and 7

$$\textcircled{A} + \textcircled{B} - \textcircled{C} \times \textcircled{D} \div$$

A quantity increased by 9

$$\textcircled{A} + \textcircled{B} - \textcircled{C} \times \textcircled{D} \div$$

**could be described as multiplying by half or dividing by 2.

Activity/Lesson:

Introduce academic vocabulary to students. Review basic terms such as expression, numerical, algebraic, sum, difference, product, and quotient. Discuss other words that may indicate mathematical operations.

- increased by
- more than
- minus
- decreased by

- less
- less than
- times
- divided by
- half
- the quantity

Addition

I Do

Introduce a simple numerical expression involving addition. Discuss the different ways to describe the mathematical situation. Encourage participation by asking for multiple ways to “name” the expression.

- $5 + 6$: six more than 5; the sum of five and six; five plus six

We Do/You Do with a Partner

Have students formulate their own examples of numerical expressions involving addition and have them share their examples and the different ways to “name” their expressions.

I Do

Next, replace one of the numbers with a variable, transitioning into algebraic expressions. Discuss the different ways to describe the mathematical situation.

- $x + 6$: six more than a number; the sum of a number and six; a number plus six; a number increased by 6; the quantity of a number and six

We Do/You Do with a Partner

Have students formulate their own examples of algebraic expressions involving addition and have them share their examples and the different ways to “name” their expressions.

Multiplication

I Do

Introduce a simple numerical expression involving multiplication. Discuss the different ways to describe the mathematical situation. Encourage participation by asking for multiple ways to “name” the expression.

- $8 \bullet 7$: eight times seven; seven times eight; the product of 7 and 8; eight multiplied by seven

We Do/You Do with a Partner

Have students formulate their own examples of numerical expressions involving multiplication and have them share their examples and the different ways to “name” their expressions.

I Do

Next, replace one of the numbers with a variable, transitioning into algebraic expressions. Discuss the different ways to describe the mathematical situation.

- $8 \bullet y$: eight times a number; the product of 8 and a number, y

We Do/You Do with a Partner

Have students formulate their own examples of algebraic expressions involving multiplication and have them share their examples and the different ways to “name” their expressions.

Division

I Do

Introduce a simple numerical expression involving division. Discuss the different ways to describe the mathematical situation. Encourage participation by asking for multiple ways to “name” the expression.

- $\frac{51}{3}$: fifty-one divided by 3; the quotient of 51 and 3; fifty-one shared equally among three groups

We Do/You Do with a Partner

Have students formulate their own examples of numerical expressions involving division and have them share their examples and the different ways to “name” their expressions.

I Do

Next, replace one of the numbers with a variable, transitioning into algebraic expressions. Discuss the different ways to describe the mathematical situation.

- $\frac{n}{3}$: a number, n , divided by three; the quotient of a number and 3; a quantity, n , shared among 3 groups

We Do/You Do with a Partner

Have students formulate their own examples of algebraic expressions involving division and have them share their examples and the different ways to “name” their expressions.

Subtraction

I Do

Introduce a simple numerical expression involving subtraction. Discuss the different ways to describe the mathematical situation. Encourage participation by asking for multiple ways to “name” the expression.

- $17 - 5$: seventeen minus five; the difference of 17 and 5; 5 less than 17; five fewer than seventeen
- ✓ Point out that because subtraction is not commutative, order matters greatly!
- ✓ Ask if changing the order with the operations changes the outcome (no for addition & multiplication, yes for division).

We Do/You Do with a Partner

Have students formulate their own examples of numerical expressions involving subtraction and have them share their examples and the different ways to “name” their expressions.

I Do

Next, replace one of the numbers with a variable, transitioning into algebraic expressions. Discuss the different ways to describe the mathematical situation.

- $z - 5$: a number, z , decreased by 5; z minus 5; five less than a number

We Do/You Do with a Partner

Have students formulate their own examples of algebraic expressions involving subtraction and have them share their examples and the different ways to “name” their expressions.

Expressions with Multiple Operations

I Do

Introduce some simple numerical expressions involving more than one operation. Discuss the different ways to describe the mathematical situation. Encourage participation by asking for multiple ways to

“name” the expression.

- $(3)(4) + 7$: the product of 3 and 4, increased by 7; seven added to the quantity three times four; 7 more than the product of 3 and 4; the sum of 7 and the product of 3 and 4
- $\frac{56}{8} - 2$: 2 less than the quotient of 56 and 8; 2 less than the quantity 56 divided by 8; the quotient of 56 and 8, decreased by 2
- $\frac{5+13}{3}$: the sum of 5 and 13, divided by 3; the quotient of the quantity five plus thirteen, and three

We Do/You Do with a Partner

Have students formulate their own examples of numerical expressions involving more than one operation and have them share their examples and the different ways to “name” their expressions.

I Do

Next, replace one of the numbers with a variable, transitioning into algebraic expressions. Discuss the different ways to describe the mathematical situation.

- $\frac{x+4}{9}$: the quotient of the quantity of a number and 4, divided by 9; the sum of a number and 4, all divided by 9
- $6x - 1$: one less than the product of a number and 6; 6 times a number, decreased by 1

We Do/You Do with a Partner

Have students formulate their own examples of algebraic expressions involving more than one operation and have them share their examples and the different ways to “name” their expressions.

Activity (master copies on pages 7 – 9)

Have students work in pairs for a matching activity. The objective is to match the written expression(s) with the algebraic expression(s).

Assessment/Ticket Out the Door (master copy on page 6)

Students will complete a selected response assessment, indicating whether an algebraic expression matches a written expression.

Key:

$9 - 7x$

☐ A Yes ☒ B No

9 minus the quantity of 7 times x

$7x - 9$

☒ A Yes ☐ B No

$9 < 7x$

☐ A Yes ☒ B No

9 is less than 7 times x

$x(9 - 7)$

☐ A Yes ☒ B No

x times the quantity of 9 minus 7

$(x)(7) - 9$

☒ A Yes ☐ B No

Warm-Up

Fill in the circle next to the mathematical operation that describes the underline word in the expression.

A number decreased by 10

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

The sum of a number and 8

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

The product of 3 and a number

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

5 times a quantity

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

The difference of two consecutive integers

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

Half of a number

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

The quotient of a number and 7

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

A quantity increased by 9

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

Warm-Up

Fill in the circle next to the mathematical operation that describes the underline word in the expression.

A number decreased by 10

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

The sum of a number and 8

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

The product of 3 and a number

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

5 times a quantity

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

The difference of two consecutive integers

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

Half of a number

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

The quotient of a number and 7

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

A quantity increased by 9

Ⓐ + Ⓑ - Ⓒ × Ⓓ ÷

Ticket Out the Door!

Choose Yes or No to indicate which of the following match the expression “Nine less than 7 times a number.” If the algebraic expression does not match, write an expression it DOES represent.

$9 - 7x$ Ⓐ Yes Ⓑ No

$7x - 9$ Ⓐ Yes Ⓑ No

$9 < 7x$ Ⓐ Yes Ⓑ No

$x(9 - 7)$ Ⓐ Yes Ⓑ No

$(x)(7) - 9$ Ⓐ Yes Ⓑ No

Ticket Out the Door!

Choose Yes or No to indicate which of the following match the expression “Nine less than 7 times a number.” If the algebraic expression does not match, write an expression it DOES represent.

$9 - 7x$ Ⓐ Yes Ⓑ No

$7x - 9$ Ⓐ Yes Ⓑ No

$9 < 7x$ Ⓐ Yes Ⓑ No

$x(9 - 7)$ Ⓐ Yes Ⓑ No

$(x)(7) - 9$ Ⓐ Yes Ⓑ No

five less than three times a number	$3x - 5$
the quotient of a number and 6	$\frac{x}{6}$
6 fewer than a number	$y - 6$
a number divided by 9	$\frac{n}{9}$
9 times the sum of a number and 4	$9(n + 4)$
9 decreased by a number	$9 - p$
the product of a number and 7	$7p$
4 times the sum of a number and 30	$4(x + 30)$
2 less than the quotient of d and sixteen	$\frac{d}{16} - 2$
9 more than 2 multiplied by f	$2f + 9$
a number times seven	$9 - x$

the quotient of a number and 9	a number decreased by 6
six less than a number	$(7)(g)$
a number divided by six	the difference of nine and a number
four more than three times a number	$4 + 3q$
$3b + 4$	$(x)(3) - 5$

Key:

five less than three times a number

- ✓ $3x - 5$
- ✓ $(x)(3) - 5$

the quotient of a number and 6

a number divided by 6

- ✓ $\frac{x}{6}$

6 fewer than a number

a number decreased by 6

six less than a number

- ✓ $y - 6$

4 times the sum of a number and 30

- ✓ $4(x + 30)$

a number divided by 9

the quotient of a number and 9

- ✓ $\frac{n}{9}$

9 times the sum of a number and 4

- ✓ $9(n + 4)$

9 decreased by a number

- ✓ $9 - p$

the difference of nine and a number

- ✓ $9 - x$

the product of a number and 7

a number times seven

- ✓ $7p$
- ✓ $(7)(g)$

2 less than the quotient of d and sixteen

✓ $\frac{d}{16} - 2$

four more than three times a number

✓ $4 + 3q$

✓ $3b + 4$

9 more than 2 multiplied by f

✓ $2f + 9$

$3b + 4$