

LEARNING OBJECTIVE: We will write and evaluate expressions based on real world scenarios. (G7M2L15)

"SIMPLIFY"
"PLUG IN"
"SUBSTITUTE"
MATH TERMS
W/O AN EQUAL SIGN.

CONCEPT DEVELOPMENT:

Expression: An expression is

- A number or letter (that can be raised to a whole number exponent) that represents a number. → VARIABLE.

○ Examples:

3 x x² -2

- The product of a letter and/or number

○ Examples:

3 · -2 4 · x or 4x a · b or ab

- The sum or difference of products of letters and/or numbers.

○ Examples:

3x² + 3 - y 4 × 2 + y - x + 5, → 9 + 3y
 135x⁵⁰¹ + 3m²⁵ → 7 · (4y + 3)

When we evaluate expressions, we are replacing each variable with the corresponding numerical value to find equivalent expressions.

Example: Evaluate 3x - 5 when x = 7

3 · 7 - 5
 21 - 5
 16

Writing Expressions Involving Discounts:

We can write expressions involving discounts in several ways—either by looking at the discount amount or the sale price amount.

Example: If you're given a 20% discount off an item use the chart below to generate expressions involving the discount.

Original Price (100%)	Discount (20%)	Amount you pay (80%)	Expression (How much you save)
\$100	\$20	\$80	.20(100) OR (1-.80)(100)
\$50	\$10	\$40	.20(50) OR (1-.80)(50)
\$28	\$5.60	\$22.40	.20(28) OR (1-.80)(28)
\$14.50	\$2.90	\$11.60	.20(14.50) OR (1-.80)(14.50)
\$x	.20x	.80x	.20x OR x - .80x

GUIDED PRACTICE:**Steps for Evaluating Expressions.**

1. Read the problem carefully.
2. Replace the variable with the correct number.
3. Evaluate to find an equivalent expression.

Evaluate $2a + 3b$
When $a = -3$ and $b = 5$

$$2(-3) + 3(5)$$

$$-6 + 15$$

$$\boxed{9}$$

Evaluate $5x - 3y$
When $x = 4$ and $y = 2$

$$5(4) - 3(2)$$

$$20 - 6$$

$$\boxed{14}$$

Evaluate $3(4x + 3y - 6)$
When $x = -2$ and $y = -4$

$$3(4(-2) + 3(-4) - 6)$$

$$3(-8 + (-12) - 6)$$

$$3(-20 - 6)$$

$$3 \cdot -26$$

$$\boxed{-78}$$

$$3(4x + 3y - 6)$$

$$12x + 9y - 18$$

$$12(-2) + 9(-4) - 18$$

$$-24 + (-36) - 18$$

$$-60 - 18$$

$$\boxed{-78}$$

Evaluate $4(2w - 5 - 6v)$
When $w = -1$ and $v = -3$

$$4(2(-1) - 5 - 6(-3))$$

$$4(-2 - 5 - (-18))$$

$$4(-7 - (-18))$$

$$4(11)$$

$$\boxed{44}$$

3 friends are at the movies. Each buy medium sized popcorns for p dollars and small Sprites for s dollars. Write an expression that would represent how much they spent total at the concession stand. Determine how much they spent total if the popcorns were \$6.50 and the drinks were \$4.00.

$$3(p+s) \text{ or } 3p + 3s$$

$$3(6.50 + 4)$$

$$3(10.50)$$

$$\boxed{31.50}$$

5 friends are at Taco Bell. Each get Mountain Dew (m dollars) and a quesarito (q dollars). Write an expression that would represent how much spent total at Taco Bell. IF the drinks were \$1.75 each and the quesaritos were \$3.25 each, how much did they spend? *

$$5(m + q)$$

$$5(1.75 + 3.25)$$

$$5(5)$$

$$\boxed{\$25}$$

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Steps for Evaluating Expressions.

1. Read the problem carefully.
2. Replace the variable with the correct number.
3. Evaluate to find an equivalent expression.

The following questions are based on the scenario below:
 John's father asked him to compare different cell phone plans to identify which plan would be least expensive for the family. Use the information contained in the table below to answer the questions:

Name of Plan	Monthly fee (includes 1,500 shared minutes)	Price per phone line (x)	Price per line for unlimited texting (y)	Price per line for Internet access (z)
Verizon	\$70	\$20	\$15	\$15
AT&T	\$90	\$15	\$10	\$20
Sprint	\$200	\$10	Included in monthly fee	Included in monthly fee

Write expressions to represent how much each plan would cost once we know the exact needs of the family:

Verizon:

AT&T:

Sprint:

Four people want a phone, four people want unlimited texting, and the family needs two internet lines. How much will each plan cost?

Verizon:

AT&T:

Sprint:

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Steps for Evaluating Expressions.

1. Read the problem carefully.
2. Replace the variable with the correct number.
3. Evaluate to find an equivalent expression.

<p>At Target, you see that a chair that cost x dollars has been discounted 30%.</p> <p>Write an expression that represents the amount of the discount:</p> <p>Write an expression that represents the new price after the discount:</p> <p>If the original price of the chair was \$35, what is the discount price?</p>	<p>While you are shopping in Costco, you notice they have headphones (h dollars) for sale—40% off!</p> <p>Write an expression that represents the amount of the discount:</p> <p>Write an expression that represents the new price after the discount:</p> <p>If the original price of the headphones was \$140, what is the discount price?</p>
<p>What a happy time. You are buying a new car. There is a 20% discount for the specific car you want. You do, however, have to pay taxes (8% sales tax) on this purchase. Write an expression that represents how much you'd pay for the car.</p> <p>How much is the car if the original price of the car is \$25,000?</p>	<p>For your 12th birthday, your parents take you to the American Girl store in Palo Alto, and tell you can buy whatever you want. You see a doll that you want and score—it's discounted 15%! You do have to pay 8% sales tax to take home your doll. Write an expression that would represent this purchase.</p> <p>How much would the doll cost if the original price were \$130?</p>

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INDEPENDENT PRACTICE:

Steps for Evaluating Expressions.

1. Read the problem carefully.
2. Replace the variable with the correct number.
3. Evaluate to find an equivalent expression.

<p>A football team has 3 touchdowns (t), 3 extra points (e) and 4 field goals (f). Write an expression that would represent the total number of points the team scored.</p> <p>How many points did they score if touchdowns are 6 points, extra points are 1 point, and field goals are 3 points each?</p>	<p>You're planning a barbecue and you need hot dogs and buns. You go to Safeway, and get 3 packs of hot dogs (h) and 4 packages of hot dog buns (b). Write an expression for the number of hot dogs and buns you purchased.</p> <p>If there are 8 hot dogs in a package, and 6 buns in a package, do you have enough hot dogs to fill every bun? How do you know?</p>
<p>Write two other expressions that are equal to $8x - 12$.</p>	<p>Write two other expressions that are equal to $8x - 6y$</p> <p>Evaluate the expressions if $x = \frac{1}{2}$ and $y = 1$</p>

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Refer to the expressions created on page 3 of this lesson and answer the following questions.

John's father asked him to compare different cell phone plans to identify which plan would be least expensive for the family. Use the information contained in the table below to answer the questions:

Name of Plan	Monthly fee (includes 1,500 shared minutes)	Price per phone line (x)	Price per line for unlimited texting (y)	Price per line for Internet access (z)
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Sprint	\$200	\$10	Included in monthly fee	Included in monthly fee

Four People want a phone line, four people want unlimited texting, and all four want internet lines.

Verizon:

AT&T:

Sprint:

Which cell phone plan is cheapest?

Two people want a phone line, two people want unlimited texting and the family needs only 2 internet lines.

Verizon:

AT&T:

Sprint:

Which cell phone plan is cheapest?

NAME: _____

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ACTIVATING PRIOR KNOWLEDGE:

We know how to use the distributive property to create equivalent expressions, and write expressions in many different ways

$6(12 + 10)$	$8(5 + 11)$
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CLOSURE:

TEACHER NOTES:

This lesson combines lessons 18-19 from Engage NY

HW: KHAN INTERPRETING LINEAR EXPRESSIONS