

Lesson 2-1 Variables and expressions

SWBAT: Evaluate algebraic expressions with variables by substituting a number into each variable.

**Vocab Words:**

Variable –

Numerical expression –

Algebraic expression –

Substitute –

Evaluate –

**Algebraic expressions:**

- Look like this:
- We cannot get an answer until we know what \_\_\_\_\_.
  - If we do not know what number  $x$  represents there can be an infinite number of answers for  $2x - 8$ .
- We first need to know what all of the operations are in the expression. What operations do you see? What operation do you think  $2x$  represents?
- When a variable and a number are right next to each other, it represents \_\_\_\_\_. You would multiply  $2 \cdot x$ .
- Evaluate  $2x - 8$  for  $x = 11$ .
  - Now we can find an answer to this expression. Since we know what  $x$  is we can substitute the number in for the variable.

$$2(11) - 8 =$$

$$22 - 8 =$$

$$14$$

Evaluate each expression:

$$3x + 15 \text{ for } x = 9$$

$$5m \div 7 \text{ for } m = 7$$

$$56 - 4k \text{ for } k = 6$$

Evaluate each expression.

$$11t - 6v \text{ for } t=9 \text{ and } v=4$$

$$2ab \text{ for } a=35 \text{ and } b=3$$

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Word Problems:

You earn \$3 for each person who plays the game at your booth at the school fair. The expression  $3p$  represents the amount of money you earn, where  $p$  is the number of people who play your game. If 15 people played the game, how much money would you earn? How about 85 people?

The rental fee for a bike is \$8 plus \$3 for each hour the bike is rented. What expression can we create to represent how much the bike would cost to rent  $h$  hours?

A dog walker charges \$10 to walk large dogs and \$6 to walk small dogs. Write an algebraic expression to represent how much the dog walker would charge to walk types of dogs at the same time. How much would it cost for the dog walker to walk 3 large dogs and 5 small dogs together?

**Challenge:** Bob plays a game at the school fair. He starts with 0 points and gets 25 shots. He wins 12 points for hitting the target and loses 8 points for each miss. Bob ends with a score of 0. How many hits and misses does Bob have?