

# Modeling with Expressions

**Objective:** We will be able to interpret algebraic expressions in term of their context.

## Vocabulary

**Expression** - is a mathematical phrase that contains operations, numbers, and/or variables.

$$3x + 5y - 6 \leftarrow \text{Constant}$$

**Term** - of an expression are the parts that are being added/subtracted.

$$\left. \begin{array}{l} 3x \\ 5y \\ -6 \end{array} \right\} \text{terms}$$

$$\underbrace{3x, 5y, -6}_{\text{terms}}$$

**Coefficient** - is the numerical factor of a variable term.

$$3, 5$$

**Numerical expression** - contains only numbers.

$$3 + 5 - 6$$

**Algebraic expression** - contain at least one variable.

$$3x + 6, 3x, x$$

**Equivalent Expression** - is where an expression are the same.

$$3(3x + 3) \longleftrightarrow 9x + 9$$

**Constant** - is a # w/out a letter

1 Example



A Identify the terms and the coefficients of the expression  $8p + 2q + 7r$ .

terms:  $8p, 2q, 7r$  ; coefficients:  $8, 2, 7$

Constant= none

B Identify the terms and coefficients of the expression  $18 - 2x - 4y$

terms:  $-2x, -4y, 18$  ; coefficients:  $-2, -4$

Constant= 18

2 Example

Tickets to an amusement park are \$60 for adults and \$30 for children. If  $a$  is the number of adults and  $c$  is the number of children, then the cost for  $a$  adults and  $c$  children is  $60a + 30c$ .

A What are the terms of the expression?  $60a, 30c$

B What are the factors of  $60a$ ?  $60, a$

C What are the factors of  $30c$ ?  $30, c$

D What are the coefficients of the expression?  $60, 30$

E Interpret the meaning of the two terms of the expression.

$60a$  = The total cost of an adult ticket

$30c$  = the total cost of a ~~the~~ child ticket.

**3** Example

The price of a case of juice is \$15.00. Fred has a coupon for 20 cents off each bottle in the case. The expression to find the final cost of the case of juice is  $15 - 0.2b$ , wherein  $b$  is the number of bottles

**A** What are the terms of the expression?

$15, -0.2b$

**B** What are the factors of each term?

$-0.2, b$

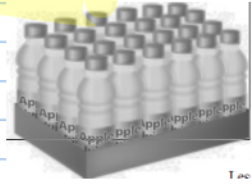
**C** Do both terms have coefficients? Explain.

No, because 15 does not have a variable.

**D** What are the coefficients?  $-0.2$

**E** What does the expression  $15 - 0.2b$  mean in the given situation?

$15 - 0.2b \rightarrow$  The total cost of the case of juice with a discount.



**4** Example

**Interpret the algebraic expression corresponding to the given context.**

Curtis is buying supplies for his school. He buys  $p$  packages of crayons at \$1.49 per package and  $q$  packages of markers at \$3.49 per package. What does the expression  $1.49p + 3.49q$  represent?

**A** Interpret the meaning of the term  $1.49p$ . What does the coefficient 1.49 represent?

**B** Interpret the meaning of the term  $3.49q$ . What does the coefficient 3.49 represent?

**C** Interpret the meaning of the entire expression.