

Essential Question: How do we write algebraic expressions to model situations? How do we interpret algebraic expressions?

Do Now: Write an algebraic expression to model each of the following scenarios.

a) Express the total amount earned if a person works h hours and gets paid \$5 per hour.

b) Express the total number of animals in a pet store if there are c cats, d dogs and m mice.



c) Express the total cost of 2 drinks and 3 slices of pizza if d represents the cost of one drink and p represents the cost of one pizza slice.

STOP HERE.

- 1) Last month, Lizzie volunteered 20 hours at her local library. Starting this month, she plans to volunteer 5 hours per week for w weeks at the library. Write an algebraic expression to represent the total number of hours she will have volunteered after w weeks.

Variable	Meaning
Terms	

Expression: _____ Units: _____

IT'S YOUR TURN NOW:

- 1) How would you express the cost of three hamburgers if each hamburger costs d dollars? What are the units associated with the expression?



- 2) It costs \$20 per hour to bowl and \$3 for shoe rental. Write an algebraic expression to represent the total cost for n hours of bowling. What are the units associated with the expression?



- 3) Express the price of a sweater (p) with an 8% sales tax.

- 4) Express the price of a meal (m) plus an 18% tip for the meal.
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Think about this:

One of the most famous amusement parks in our country is Hershey Park. This past summer, Mr. and Mrs. Smith took their daughter on a trip to Hershey, Pennsylvania to visit the historic site and go on some rides. Admission to enter the park was \$25, while low thrill rides cost \$2 each and high thrill rides cost \$3 each.

The expression $3a + 2b + 25$ represents the cost of one person visiting the park.

- a) Identify the **variables** of the expression and the **terms**.

Variables: _____

Terms: _____

b) If Mrs. Smith went on 5 **low thrill** rides and 2 **high thrill** rides, how much money did she spend?

Remember: Admission to enter the park was \$25, while **low thrill rides** cost \$2 each and **high thrill rides** cost \$3 each. The expression $3a + 2b + 25$ represents the cost of one person visiting the park.



Let's take a closer look at the "Think about this question".

Term/Variable	Meaning
a	
b	
3a	
2b	
25	

Let's try this...

Aidan works at Abercrombie in the Roosevelt Field mall. With every customer he assists, he earns a 3% commission of their purchase in addition to his regular salary.

a) On Monday, he assisted a customer who purchased a sweater for \$49.99. How much did he earn in commission?

b) If Aidan only assisted that one customer on Monday and he earns a salary of \$25 per day, what were his total earnings for the day?

Interpreting Expressions

Samantha works at a furniture store and earns commission on the items she sells. She earns a base pay of \$80 plus 5% of the value of any merchandise she sells. Samantha uses the expression $80 + .05t$, where t represents her total sales in dollars, to calculate her total earnings.

A. Identify the terms of the expression. What does each term in the expression represent?

Term	Meaning



B. If Samantha sells \$475 in merchandise, compute the total amount of money that she will earn.

Jordan works for the same company. Since he was just hired, he earns 5% of the value of merchandise he sells that exceeds \$200. Jordan uses the expression $80 + .05(t - 200)$, where t represents his total sales in dollars, in order to calculate his total earnings.

C. How does Jordan's expression differ from Samantha's expression?

D. How much would Jordan earn if he sold \$475 worth of merchandise?



1. Algebraic expressions help us represent relationships symbolically. When writing an algebraic expression, identify the words that translate into _____, _____ and _____.
2. Algebraic expressions help us represent relationships. When analyzing an expression, identify the _____ and _____ of the expression and **interpret** their meaning.

1) You purchase n cartons of tennis balls at \$25 per carton from an online retailer that charges 8% tax and \$17 in shipping costs. The expression $25n + .08(25n) + 17$ can be used to represent the total cost.

A. What does $25n$ represent? _____

B. What does $.08(25n)$ represent? _____

C. What does 17 represent? _____

D. How much would it cost if you purchased 5 cartons of tennis balls? _____

2) Ben purchased adult and child tickets for a play through a website. He paid \$4 per child ticket and \$9 per adult ticket. The expression below represents James' total purchase.

$$4c + 9a$$

A) What do the variables c and a represent?

B) What does each term of the expression represent?

C) How would the expression change if James had to pay a \$10 processing fee?

3. Alex purchased a 6 hour calling card. He has used x minutes of access time. Write an algebraic expression to represent how much time he has remaining on the card. Identify the units associated with the expression.

4. A used bookstore sells paperback fiction books in excellent condition for \$2.50 each and paperback books in fair condition for \$0.50 each. Write an expression for the cost of buying x excellent-condition paperback books and f fair-condition paperback books.

5. Charlie has 3 fewer \$20-bills than he has \$10-bills. Write an algebraic expression to represent how much money Charlie has in total. Use b to represent the number of \$10 bills. What are the units associated with the expression?

Multiple Choice

6. The owner of a small appliance repair business has one employee, who is paid an hourly rate of \$25. The owner estimates his weekly profit using the expression $8300 - 25x$. In this expression, what does x represent?
 - (1) the number of appliances repaired per week
 - (2) the amount of hours worked per week by the employee
 - (3) the number of customers served per week
 - (4) the number of days the employee works per week