**Algebra RH**

**Essential Questions: How do we interpret algebraic expressions? How do we translate words to symbols?**

**Do Now:**

Jaime works on commission for a furniture store. She earns a base pay of $80 plus 5% of the value of any merchandise she sells. Jaime 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?

B. If Jaime 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 any merchandise sold that exceeds a total of $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. Can Jordan's expression be simplified?

D. How does Jordan's expression differ from Jaime's expression?

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

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**Let's Translate!**

Write an algebraic expression for each verbal expression.

(1) A ballpoint pen sells for $0.39. Represent the cost of $x$ pens. _____

(2) If the distance from Hilda's school to her home is 145 miles, represent the distance remaining if she has traveled $m$ miles. _____

Now let's try some more complex expressions!

(3) Write an expression for the price of a sweater, $x$

(a) with an 8% sales tax _____

(b) with a 20% discount _____

(c) with a 20% discount and then an 8% sales tax _____

(d) identify the units associated with this expression _____

(4) Write an expression for a taxi ride that charges an initial fee of $5.50 and $0.50 for each mile.

(5) Write an expression for a taxi ride that costs $2.50 for the 1st mile and $0.75 for each additional mile.

(6) 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, and identify the units associated with the expression.

(7) Charlie has 3 fewer $20-bills than he has $10-bills. Write an algebraic expression to represent how much money Charlie has in total.

**Now You Try!!!!**

**Translate each statement into an algebraic expression.**

1. The number of kilometers traveled by a bus is represented by $x$. If a train traveled 200 kilometers farther than the bus, represent the number of kilometers traveled by the train.

2. Mr. Gold invested \$1,000 in stocks. If he lost $d$ dollars when he sold them, represent the amount he received for them.

3. The cost of a fur coat is 5 times the cost of a cloth coat. If the cloth coat costs $x$ dollars, represent the cost of the fur coat.

4. The length of a rectangle is represented by $L$. If the width of the rectangle is one-half of its length, represent its width.

5. After 12 centimeters had been cut from a piece of lumber, there were $c$ centimeters left. Represent the length of the original piece of lumber.

6. Paul and Martha saved \$100. If the amount saved by Paul is represented by $x$, represent the amount saved by Martha.

7. The sum of two numbers is $s$. If one number is represented by $x$, represent the other number in terms of $s$ and $x$.

8. A suit costs \$150. Represent the cost of $n$ suits.

9. A man spent \$250 for a suit and a coat. If he spent $y$ dollars for the coat, represent the amount he spent for the suit.

10. The width of a rectangle is $x$ centimeters. Represent the length of the rectangle if it exceeds twice the width by 3 centimeters.

11. Represent the total number of calories in $x$ peanuts and $y$ potato chips if each peanut contains 15 calories and each potato chip contains 18 calories.

12. The charges for a long distance telephone call are \$0.45 for the first 3 minutes and \$0.09 for each additional minute. Represent the cost of a telephone call that lasts $m$ minutes when $m$ is greater than or equal to 3.