Applications of Linear Equations

Consecutive Integers: \( x, x + 1, x + 2, \ldots \)

Consecutive Even or Odd Integers: \( x, x + 2, x + 4, \ldots \)

Perimeter of a Rectangle: Add up all the sides or \( P = 2l + 2w \)

Steps for word problems:
1. Define your variable.
2. Write the equation.
3. Solve the equation.
4. Answer the question.

Examples:
1. Nine times a number minus 2 is 5. What is the number?

2. Find four consecutive integers whose sum is 406.

3. Find three consecutive odd integers whose sum is \(-21\).

4. Find three consecutive even integers whose sum is \(-36\).
5. A 115 inch board is cut into three pieces. The second piece is four times longer than the first piece. The third piece is 25 inches longer than the first piece. How long is each piece?

6. A 40-cm board is cut into three pieces. The first piece is twice as long as the third piece. The second piece is one-third as long as the third piece. How long is each piece?

7. The perimeter of a rectangle is 58 ft. The length is 5 feet more than two times the width. What are the dimensions of the rectangle?
8. The perimeter of a rectangle is 100 ft. The length is 6 ft less than 3 times the width. What are the dimensions of the rectangle?

Money problems:

If I have 3 quarters, I have 75¢. $3(\text{value of coin}) = \$\text{money}$
If I have 9 nickels, I have 45¢. $9(\text{value of coin}) = \$\text{money}$

$\text{(How many of the item)}(\text{Value of the item}) = \$\text{Total money}$

9. Katy has $5.70 in dimes and quarters. The number of dimes is 2 more than 3 times the number of quarters. How many of each type of coin does she have?

10. Jack has $280 in fives and tens. The number of fives is four less than two times the number of tens. How many of each bill does he have?